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WHO KNOWS THE FOREST? INDIGENOUS KNOWLEDGE AND FOREST MANAGEMENT IN MID-HILLS NEPAL

BY

REBECCA LEIGH SAUL ©

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF ANTHROPOLOGY

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **Who Knows the Forest? Indigenous Knowledge and Forest Management in Mid-hills Nepal**, by Rebecca Leigh Saul in partial fulfilment of the requirements for the degree of Master of Arts.

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Date April 15, 1993

ABSTRACT

Upon embarking for Nepal, I had one rather large research question, or problem: "What is the relationship between women and the forest?" Within the first week in the field, the list had expanded to some fifty questions. By the end of several months in the field, I had "a problem".

What began as a question became a thesis which explores the relationships between people and the forest. For comparative purposes - and out of sheer curiosity - I expanded the research to include men. As my research progressed, patterns of knowledge began to emerge which indicated that certain people know certain things for certain reasons.

These patterns are complex, and not always what one would have predicted. In search for explanations which would illuminate the central problem of the relationship between local people and forest management, I began to investigate caste, age, socio-economic, and demographic variables and their influence on the indigenous knowledge system.

What I present in this thesis is a description and analysis of an indigenous forest knowledge system. I place my findings within the larger social forestry context, focusing on user conflict and disadvantaged groups within the community.

The conclusions drawn in this thesis are based on research in one neighbourhood of a village, which has been compared to and contrasted with data collected elsewhere. Conformation to and divergence from general patterns are noted, and attention drawn to large discrepancies. But national, or even regional, generalizations must be offered cautiously, if at all.

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I owe a great debt of thanks to many people who gave me their advice, encouragement and friendship during preparation for fieldwork, and the research and writing of this thesis. I am extremely grateful to Dr. Bruce Morrison. His faith in me and his unfailing guidance enabled me to both reach Nepal and survive in the field. "Uncle Bruce" has been trying to make a scholar of me for several years now, and I hope that he has succeeded just a bit.

Through Bruce Morrison I was introduced to Dr. Donald Messerschmidt, a Himalayan scholar, anthropologist, and social forester of renown who was working at the Institute of Forestry in Pokhara. "Doctor Don" aided me both academically and nutritionally: he was my in-field supervisor and, along with his cook, an ever-present source of wonderful, "home-cooked" meals.

In Nepal there were a great many people who helped me tremendously in my fieldwork. I owe very special thanks to my research assistant, Ms. Sushila Nepali, a social forester and researcher in her own right. Sushila was my constant companion, nurse, and assistant during my stay in Nepal. Thankyou **didi**. The incredible generosity and hospitality of Sushila's family must also be acknowledged here.

To the villagers of Lahchowk, and Thakuri Gaun in particular, I would like to express my heartfelt gratitude. Their gentleness, eagerness, and good-humour went far further than I could ever have imagined. In particular, I would like to thank Ram Bahadur Nepali, who's insight into his own culture and ability to communicate his knowledge were extraordinary. Radhika Bandari and her family, and the Ghale family were also extremely generous and caring.

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I would also like to thank several other people for their assistance and insights. Doctors Michael Allen and Robert Fisher offered both written and verbal comments on a conference paper which discussed the central hypotheses of this thesis. Dr. Henry Lewis has also provided me with invaluable comments and constructive criticisms during the writing of this thesis.

It is with deep gratitude that I acknowledge the constant guidance and support of Dr. Rod Wilson and Dr. Helga Vierich. I have been working with Dr. Wilson for several years now, both during my undergraduate and graduate degrees. His anthropological insight and personal sensitivity are both commendable and I am deeply indebted to him. The thanks that I owe to Dr. Helga Vierich cannot be expressed adequately here. Suffice it to say that this thesis would have been written less swiftly and with much less joy were it not for her daily encouragement and unfailing friendship. She endured far more from me in the way of temper tantrums, panic attacks and bouts of depression than anyone will ever know.

Finally, I am profoundly grateful for the support and understanding of my family and close friends. In particular I would like to thank my mother for the hundreds of letters I received in the field, my father for cheerfully keeping my life at home in order, and my brother for visiting me in the field and allowing me to see Nepal again through his eyes. Last, but by no means least, I would like to say thankyou to Tim Calder for his patience, his help, and his love and dedicate this thesis to him.

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INTRODUCTION

Nepal is marked by ecological, socio-cultural, economic, and historical diversity. The southern-most region of Nepal is sub-tropical, while only a few hundred miles to the north are the snow-capped peaks of the Himalaya. Nepal is home to a large number of cultural groups with diverse origins, who practice Hinduism, Buddhism, Lamaism, shamanistic animism, and a number of other minor religions. The diverse ecological and socio-cultural makeup of the country has resulted in both a colourful history and in a great variety of exploitation patterns.

This thesis investigates how historical processes and present cultural-ecological and socio-economic diversity effect the relationships between people, and between people and their forest resources in one village in the mid-hills of Nepal. In The Purpose of Forests, Jack Westoby writes that "[F]orestry is not about trees, it is about people. And it is about trees only insofar as trees can serve the needs of the people" (Messerschmidt 1990:frontispiece). That is why, if Nepal's forests are to be utilized in an equitable and sustainable manner, we must learn more about not only the natural environment but, more importantly, about the cultural environment in which forest management occurs.

Research on indigenous forest knowledge and management systems has the potential to help improve our understanding of the underlying cultural complexities of rural resource management, to facilitate appropriate and sustainable development and extension efforts, and to recognize the efforts of indigenous groups to both preserve and improve upon traditional technologies. There is little time remaining in which to identify, record, and possibly preserve the traditional systems of knowledge which inform resource management in traditional land economies. "To put it simply," writes Klee, "traditional methods of managing resources should not be allowed to die" (1980:284). They must be recorded, understood, and utilized.

The structure of this thesis needs a brief explanation. It is best described, perhaps, as an exercise in progressive contextualization: rather than presenting a general introductory chapter which discusses the history, geography, and politics of Nepal, and then moves to the specifics of my research area and problem, I provide the reader with relevant information as it becomes necessary for an understanding of what follows. In this way, the structure of the thesis is somewhat chronological in terms of my own process of learning and discovery.

The first chapter briefly describes the natural setting and cultural makeup of Nepal. These were the topics I was very familiar with upon entering the field. The second chapter progresses through the theoretical and methodological steps that I myself took in the field. Chapter three discusses "forest problems" in Nepal, problems which were revealed in my initial literature review and became my central focus in the field, and introduces a possible approach for overcoming these resource problems. The following three chapters present both the data collected in the field, and analyses of these data. These, too, are chronological in presentation, for I first learned about "the rules" of forest use and management, then I observed and investigated the real behaviour of villagers. In this context, I became aware of differences in behaviour and knowledge between different people and different groups of people.

My process of discovery unfolds in the pages of this thesis in very much the same fashion as it unfolded for me in the village. My field experience was both a personal and an academic journey; I recount moments of confusion and moments of enlightenment, and end up, I hope, with a thesis which describes and explains what I saw, heard, and learned.

CHAPTER I

THE CONTEXT OF THE RESEARCH

This thesis is based on fieldwork carried out between September 1991 and March 1992 in a village called Lahchowk. I chose the village of Lahchowk for a number of reasons, both personal and academic. On the personal side, Lahchowk is easily accessible from Pokhara town, where I had a small apartment. My research assistant found us a house in Lahchowk shortly after my arrival. The house was empty and afforded me both the privacy I needed and my own cooking space. My personal requirements of closeness to Pokhara and my own living area had been satisfied.

Before deciding, however, I spent several days in the village, walking around the neighbourhood and talking to villagers. I soon discovered that Lahchowk provided an excellent environment in which to pursue my specific research problem. Lahchowk community includes most of the major caste and ethnic groups represented in Nepal and thus allowed for extensive caste comparison; the community has a characteristic mid-hills farming system and both a typical communal forest management system and a number of other types of forest, which permits comparison between this study and others in the mid-hill region. In addition, both faculty and students of the Institute of Forestry, Pokhara Campus, have undertaken studies in the area which enabled me to review secondary data and place this study in a broader context.

This purpose of this chapter is fourfold: 1. to briefly describe the geography of Nepal, 2. to provide an introduction to the major cultural groups of Nepal, 3. to discuss Nepalese ethnography and follow it from its inception to the present day, and 4. to place Lahchowk geographically and culturally within the larger context of Nepal.

1. The geography of Nepal

The kingdom of Nepal is located between India and Tibet, and occupies part of the Himalayan region stretching across the top of the South Asian continent. Cutting through the three major mountain ranges of Nepal - the Himalaya, the Mahabharat and the Siwalik - is a complex river system. The three main rivers flowing into Nepal from the Tibetan plateau are, from west to east, the Karnali, the Gandaki, and the Kosi.

The country can be divided into three main ecological regions: the terai, the middle hills, and high mountains. The southern-most strip of Nepali territory, an area no more than thirty miles wide, is the terai. The terai is a sub-tropical plain which lies at the foot of the mountains bordering the Indo-Gangetic plain. Between the terai, at 1000 feet above sea-level, and the middle hills, lay three zones of transition: the Siwalik range, the inner terai, and the Mahabharat range. Just north of the terai are the Siwaliks, whose highest peaks reach 4500 feet. This area experiences severe droughts, has little forest cover, and is sparsely settled. Between the Siwaliks and the Mahabharats lies the inner terai which, like the terai, is being heavily settled and converted into wet rice farmland. The Mahabharat range has peaks from 6000-16000 feet and is relatively well forested. Its steep mountain sides support scattered settlements which give way to more dense settlements in flatter areas which can be terraced for agriculture (Saul 1990).

The broad belt of land between the terai to the south and the high mountains to the north is known as the mid-hill, or middle mountain, region of Nepal. Because the research for this thesis was carried out in a village in the mid-hills, I will discuss this area in more detail.

The mid-hill zone lies between the Siwalik range at the northern most extent of the terai and the forest-covered slopes of the high mountains to the far north, with river bottoms as low as 200 meters above sea level and the high ridges reaching up to 3000 meters. The middle mountain zone occupies about 30% of the area of the country, and contains about 33% of the country's natural forests.

Within this region are numerous narrow river valleys, hilly areas, and mountain ranges. The land is characterized by large local variations in elevation within a short horizontal distance, steep slopes, and a dense river network. The annual precipitation regime is monsoonal, giving rise to pronounced rainy seasons - June through September - and dry seasons. Water variability is often a constraining factor on farming systems and agricultural output throughout most of the region.

The mid-hills contain 50-55% of the country's population (Mahat et al. 1987). The valleys of the middle hills are very fertile, often producing two or more crop yields per year. In most higher hill areas low tempertaures restrict production to a single cold-tolerant crop per year. Temperature differences may be critical even within relatively small ranges, producing microclimates within regions.

In general, the potential for agricultural intensification decreases with altitude (Schroeder 1985). The main crops of rice, corn, wheat, and millet are grown on intensively cultivated, carefully terraced fields extending from the semi-tropical river valleys to the alpine ridges. In most villages, the raising of livestock, and the growing of fruit and vegetables are important additions to the staple diet of grain. Seasonal labour for men in India, the terai, and Bhutan during the winter is an important pattern throughout the region which helps to supplement the supply of food grain.

The last major region of Nepal, the high mountains, is composed of the Himalayan range and the inner Himalaya which stretch to the Tibetan border. This zone is characterized by mountains peaks reaching 16000-29000 feet, desolate scrub plains geographically contiguous with the Tibetan plateau, and more fertile Himalayan valleys.

This cold, sparsely populated region supports less than 10% of Nepal's population. The people of the high mountains engage in a mainly pastoral economy based on yak, cattle, and sheep. Many entire villages in the region follow their herds from high-altitude summer pasture lands to winter shelters further down in the valleys. Pastoralism is supplemented by the growing of summer crops - millet, buckwheat, barley, potatoes - and trading expeditions to sell animal products and buy foodstuffs to augment village supplies of grain (Saul 1990).

Nepalese culture is a product of historic and political processes, fostered in part by the geography of the Himalaya. The ruggedness of the mountains has tended to inhibit travel and communication between regions so that groups living close together have remained fairly isolated and have maintained or developed cultural differences which easier access might have blurred. Cultural disctinction has also been reinforced by the need to adapt to regions with different climates and terrains. Finally, the mountains form a most formidable barrier to cultural conquest and homogenization (Saul 1990). Yet despite the rugged and variable terrain, and a number of cultural isolating mechanisms, there is also considerable intermixture among cultural traditions in some areas (see Berreman 1963). As a result, the country of Nepal is ethnographically complex. It is to this ethnographic complexity that I now turn.

2. People of Nepal

The diverse peoples of Nepal have been traditionally classified into three major racial/linguistic groups. These are a small group of terai tribes which speaks Dravidian related tongues and seems to maintain certain Australoid features, the Indo-European-speaking Caucasoid people occupying the middle hills and terai areas, and the Tibeto-Burman-speaking Mongoloid groups of the middle hills and high mountains (Poffenberger 1980). These are by no means complete and mutually exclusive categories, and are too general for our purposes. What follows is a brief description of the main cultural groups within Nepal.

a. The terai

The terai region is, for the most part, inhabited by three groups: the original inhabitants (Tharu, Danwar, and Satar), the Hindu-Muslim groups which have migrated into the terai largely within the last two to three centuries, and a large number of middle hill and high mountain peoples who have settled the terai over the last 30 years. The cultural characteristics of the original tribal inhabitants conform roughly to the culture pattern prevailing among the aboriginal tribes of central India (Berreman 1963). It has been noted that Tharu, Danwar, Satar, and other tribal groups are becoming less tribally distinct because of culture contact with Hindu-Muslim groups.

Generally, the inhabitants of the terai region are described as strictly South Asian peoples who share most of their cultural traits with the people of the north Indian plain. These traits include a caste system; a strict avoidance of beef; a sedentary, agricultural economy; Nepali as the lingua franca; and the performance of Sanskrit Hindu rites. The Indic culture dominates the lowlands up to an elevation of about 2000 feet, beyond which lies the middle hills and what is referred to as the Himalayan culture area.

b. The middle hills

The Himalayan culture area is sandwiched between the Indic and Tibetan culture areas. The peoples of central and northwestern Nepal which fall in this intermediate zone are variously described as Nepali, sub-Tibetan, Himalayan, and tribal in culture.

The largest group within the middle hills are the Brahmin and Chhetri castes. Brahmin and Chhetri were traditionally concentrated in the mid-western parts of Nepal, but at present they are more widely spread throughout the country than any other group. Although these castes have tried to impose their cultural and religious practices on the ethnic groups they have come in close contact with, it is obvious that Brahmin and Chhetri have been influenced by their neighbours to a considerable extent.

The Thakuri caste is descended from the Brahmin, who came to Nepal from India during the Muslim invasions, and the Khas ruling class of Nepal. Within the Brahmin-Chhetri sphere as a whole, the name Thakuri has reference partly to a once variant ethnic heritage (that of the Khas) and partly to inheritance of a status as the remote descendant of a past ruler in western or central Nepal. Despite this quasi-separation, Thakuri not only rank as Chhetri, but to most Nepalis - including themselves - they are identifiable mainly in terms of this caste-grade and within a broadly "Brahmin-Chhetri" sphere (Doherty 1975). Prior to the arrival of these Hindu groups from the eastern and western parts of the Himalaya, the hills were inhabited by a number of Tibeto-Burman-speaking ethnic groups, such as the Newar, Gurung, Magar, Tamang, Rai, Limbu and Thakali.

Newar are the original inhabitants of the Kathmandu Valley. They are thought to have migrated from Tibet a few thousand years ago, and are predominantly responsible for developing the elaborate cultural traditions of the Kathmandu Valley. Newar are the people seen in the greatest numbers in the capital city of Kathmandu, and also in every market town and village in the outlying districts, the hills and the terai (Doherty 1978).

The Newar are a diverse group; they are "a cultural entity...not one single group in the sense that Gurungs, Magars, or Tamangs are..." (Bista 1987:16). Today the term

Newar embraces people of both Mongoloid and Mediterranean physical types who speak both Nepali, an Indo-Aryan language, and Newari, a Tibeto-Burman language. Because of their early and continued contact with both Indian and Nepali national culture, many Newar have adopted Hinduism, though significant numbers maintain their Buddhist practices.

Among the best known peoples of the middle hill region are the Gurung and Magar who occupy large areas west of Kathmandu, with the Gurung generally further north than the Magar. The early Gurung culture and adaptation of several centuries ago was based on alpine and sub-alpine forest resources exploited by means of transhumance, gathering and hunting, swidden agriculture, and trans-Himalayan trade. There are still a few Gurung, living in the highest and most northerly mountain villages, who maintain vestiges of their earlier forest and alpine exploitation (Messerschmidt 1976). As the Gurung made an ecological shift down into lower zones and adopted irrigated, terraced rice farming, there were concomitant shifts in cultural values and in social systems towards Hindu religion (traditionally the Gurung have practiced a mixture of shamanism and Tibetan Lamaism) and the hierarchical caste system.

The Gurung, with their Magar and Khas counterparts, formed the bulk of the Shah armies of Gorkha, which swept across Nepal to conquer Kathmandu Valley in 1768 and to unite the kingdom under one rule. Today, every Gurung village boasts young men in the Gurkha regiments of the British and Indian armies, and in the royal Nepal Army and police forces as well. An important source of Gurung family income is from the pensions and salaries of soldiers. Gurung who do not go in search of army service engage in agricultural labour and trading.

The Magar are a large group made up of half a dozen sub-groups. Each sub-group has very different practices - religiously, culturally, and economically. As a mother language, some Magar speak their Tibeto-Burman dialect, some speak Nepali, and a few speak Tibetan. Despite their probable Tibetan origins, and due to continuing Hindu influence, almost all Magar observe caste restrictions and claim to be Hindu (Hitchcock 1966). The Magar traditionally inhabited large forested tracts and practiced a combination of transhumant herding and slash and burn agriculture. Magar communities can be found in the traditional localities of western Nepal, from high Himalayan valleys to the plains of the terai, and eastward well into districts beyond Kathmandu.

The Tamang form one of the most populous ethnic groups in Nepal and, culturally, are fairly homogenous. Although they are found scattered over a wide area, the main Tamang territory extends in a broad arc to the west, north, and east of the Kathmandu Valley. The Tamang are one of several Tibeto-Burman speaking tribes in Nepal whose language and traditions point to an origin in Tibet and a southward migration into the Himalayan region. Sedentary agriculture, and some pastoralism and trading are the major occupations. The religious and social elements of this group, although influenced somewhat by Hinduism, are primarily either of local tribal origin or derived from Tibetan Buddhism.

The Limbu are generally regarded as among the first inhabitants of Nepal. Together with the Rai they are thought to be the descendants of the ancient Kirati, Mongolian peoples inhabiting the Himalaya (Caplan 1970). The Rai and Limbu have retained much of their original shamanistic tradition and have been little influenced by either Tibetan Buddhism or Hinduism. The Rai and Limbu are two of the few remaining tribal groups who have not been subsumed ethnically or, until recently, politically by the dominant high-caste Hindu tradition of Nepal.

The Thakali are a Tibeto-Burman speaking group inhabiting Thak Khola, the high valley of the Kali Gandaki River northwest of Pokhara town in western Nepal. The Thakali have spread, since the late 19th century, south through the middle hills. Bista (1987) suggests two reasons for this spread. The first reason for relocation was to escape the high taxation associated with the monopoly over the Tibetan salt trade. Those who could not pay the tax left the area and went to live and farm in the valleys of the middle hills. The second reason was that the Thakali are entrepreneurs, investing money in almost any potentially profitable venture. In doing so, they spent more and more time outside Thak Khola and in time many left the home area for good to settle wherever they found it most profitable.

The physical features of the Thakali closely resemble those of the Tibetans and Gurung, and these ethnic groups are difficult to distinguish. Thakali religion represents a syncretism of Lamaism, Hinduism and a type of shamanistic animism which is common in the Himalayan regions and Tibet. It is in the traditional Thakali homeland in Nepal, Thak Khola, that we find the transition from Hindu Nepal of the middle hills to Buddhist Nepal of the mountains and the northern border regions (Bista 1987).

c. The high mountains

Generally, people become more Tibetan in culture as one moves north in Nepal. Making use of local classification, which takes into account the various areas where endogamy is important, the following ethnic-Tibetan groups can be distinguished, from west to east: Humla, Mugu, Dolpo, Lo, Nar, Nyi-shang, Nub-ri, Tsum, Langthang, Sherpa, and Halung. What is termed "pure" Tibetan culture is found above 10500 feet extending north through the plateau region to the Tibetan border.

In economic organization, these high mountain groups combine agriculture and pastoralism to greater and lesser degrees: those groups living near and in the Himalayan valleys depend largely upon agriculture, while those on the desolate

Tibetan plateau emphasize or depend exclusively upon their herds. Speaking Tibetan dialects and professing Lamaistic Buddhism (despite increasing contact with Hindu populations there is still no indication that Hinduism has had any significant impact on their beliefs or social attitudes), many ethnic-Tibetan groups established profitable trade relations not only with Tibetans of nearby districts but also with the grain-growing peoples of the middle ranges and the terai (Furer-Haimendorf 1974).

I have by no means represented the entire cultural mosaic of Nepal, but I have given a brief survey of the main groups in the ethnographic literature. From this discussion of caste and ethnic group complexity, it becomes clear that the heterogeneity of Nepal eludes any attempts at broad generalization or rigid categorization. This discussion has provided a context for the following discussions of Nepalese ethnography, and of castes and ethnic groups within Lahchowk village. All of the castes and ethnic groups represented within my field site have been described above, and this will make the discussion of my research locality and the people who dwell there much clearer.

3. The development of Nepalese ethnography

Nepal was a relatively little known South Asian country until after 1950, when anthropological research began in earnest in the Himalayan region. There are several reasons for this dearth of ethnographic information. From the point of view of the dominant civilizations which have surrounded the Himalaya for millennia, the Nepalis were "a political, economic, and cultural backwater not worth bothering with" (Fisher 1985:100). In addition, Nepal was viewed by her neighbours, China and India, and later by Europe as primarily a buffer state. Political contingencies made concerted studies within Nepal difficult and, beyond the Kathmandu Valley, impossible.

It was not until the early 1950s that sustained anthropological study of the Himalaya began, initiated by Fredrik Barth in Swat, Pakistan, and Christoph von Furer-Haimendorf in Nepal. Between 1950 and 1980, anthropological research in the Nepal Himalaya increased dramatically. This was partly due to the fact that Tibet, Sikkim, and Bhutan were closed to foreigners, and Pakistan and India were off-limits to American researchers for diplomatic reasons. This explosion of anthropological research and literature resulted in Nepal and its inhabitants becoming better known and understood than their Himalayan counterparts in India and Pakistan.

Fisher (1985) reports that anthropological coverage of Nepal has been fairly uneven, however. Anthropologists have displayed a marked predilection to study remote, high Himalayan people and remnants of tribes on the verge of extinction whenever possible, to the neglect of the more politically and geographically accessible groups in Nepal. This is true for perhaps all groups studied except for the Newar of the Kathmandu Valley, about whom much has been written.

Theoretical orientations have been largely conventional, and work in Nepal has yet to make an imprint on the international scene. There has been a tendency to concentrate on those aspects of life which seem to be particularly conspicuous or well-developed, which are unique to the area, or which are - from the Western point of view - unusually exotic: religion, social structure (such as polyandry), village studies, and ecology.

Among antiquarians and modern scholars there continues to be an enduring interest in culture history and in the origins of many of the different ethnic groups and castes which inhabit Nepal. The historic interest has centred on the degree of affinity of various groups with either the Hindu heartland (India) or the Buddhist heartland (Tibet). These studies, in both Nepal and India, have traditionally focused on caste. In order to understand the social dynamics of life in a mid-hill village, I felt that I needed to understand the caste system as it operates in Nepal. Caste refers to the occupational grouping of peoples brought to Nepal by Hindu immigrants from India in about the eleventh century.

> ...attitudes...stressing control, seem to have lain behind historical occurrences [of caste] in Nepal. Various rulers in the medieval period, in different areas of what is modern Nepal, codified caste ascription and caste duties for their Indic and Tibeto-Burman subjects, as an important step in general revision and consolidation of the political system and the legal code (Regmi 1971:5).

People were divided into high castes (such as Brahmin and Chhetri) and lower or occupational castes (Damai, Kami, and Sarki, for example)[1]. Under the auspice of outlawing caste, the caste system was codified in the Mulkti Ain (National Code) of 1973. Although the true aim was to formally place non-Hindu groups within the caste stratigraphy, ethnic groups within Nepal (such as the Tibeto-Burman Magar and Gurung, and the tribal Rai and Limbu) have not been fully integrated into the caste system.

The main caste division in Nepal is between hereditarily, ritually "clean" and "unclean" groups - **pani calne** and **pani necalne** respectively. Brahmin and Chhetri, along with most ethnic groups, are ranked together as **pani calne**; Sunar (Kami), Sarki and Damai groups are ritually "unclean". Nepali idiom refers to the main, ritually relevant criterion: acceptance (**calne**) or refusal (**necalne**) of water (**pani**) offered or drawn by another. The higher castes will not accept water or food which has been handled by the occupational castes. This criterion is the only really strict barrier between these two groups, however. Hence inter-caste and inter-ethnic unions are not uncommon and a complex system has arisen for assigning caste status to the offspring of such unions.

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[1] I will refer to the untouchable or lower castes as "occupational castes." This classification refers to their traditional non-farming occupations and is, I feel, a less derogatory term.

In the face of this complex situation, various scholars presented various interpretations of the caste phenomenon in Nepal. Furer-Haimendorf (1960) proposes a definition of caste which would be specific for Nepal: **jat** or "caste" would refer primarily to "ethnic group". Dumont (1964) prefers to regard Nepal as an area where the process of acceptance of the Hindu caste ideology is incomplete and where the high incidence of inter-caste and inter-ethnic marriage is allowed and even sanctioned because of an incomplete realization of the prescription of caste endogamy.

A young Gurung man whom Doherty (1974) interviewed defined **jat** as a system for the division and control of labour[2]. The relations of Brahmin and Chhetri with lower caste persons bring out the importance of caste as a system for control, in especially striking form. Very concerned with relative status in most contexts, a Brahmin-Chhetri will often show caste preoccupations in his dealings with Kami-Sarki-Damai. He is concerned with maintaining hierarchical social distance between himself and the person of occupational caste (Doherty 1975). Beyond this general concern with status, even when not dealing with an actual servant, a Brahmin-Chhetri will often, by manner and by comment, remind a Kami-Sarki-Damai that the latter is of hereditary servant caste.

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[2] The division of household labour between the genders is also formally proscribed within the Hindu caste system, as I will discuss in more detail later. Women are not permitted to use a plow, nor are they allowed to cut the bamboo known as **baans**. Tradition, more than Hindu precepts, however, dictates accepted behaviour. Men plow, plant trees and crops, cut fodder from trees found on their own land, collect bamboo and timber from the forest; women weed, harvest and process grain, prepare meals, feed livestock, collect forest fodder and fuelwood. This division of labour is not absolute, with high caste Hindus adhering most closely to social norms regarding appropriate work, and non-Hindu and occupational caste people adhering least closely.

There is, however,

> ...very little if any major cultural differentiation between Brahmin-Chhetri and Kami-Sarki-Damai in Pokhara... Both groups share the same kinship tradition, worship the same gods, speak the same language, and so on. The subjection of the Kami-Sarki-Damai is very importantly a matter of economic and political control, which seems to have been regularized beginning with the arrival of orthodox, plains Hindus during the medieval period ... The Kami-Sarki-Damai themselves see the matter as simply one of economic and political subjection (Doherty 1975:21).

What Doherty is alluding to here is the historical background to the current social hierarchy. This history is tangible even today in the interactions of Lahchowk villagers. Without understanding the historical development of the caste system, much of my data would have been incomprehensible. The power structure within the caste system has altered little over the centuries.

Although Nepal is a Hindu state controlled largely by a Brahmin-Chhetri ruling class, Nepali culture is defined neither rigidly nor solely by the Hindu caste system. Nepali culture is highly complex, influenced both by caste organization and ideology, and by the practices and beliefs of many different tribal and ethnic groups. The relationship between the hierarchically ordered caste society of Brahmin, Chhetri, and Thakuri, and the casteless ethnic groups is non-reciprocal. While the members of the former can be easily integrated into the latter, the "multi-ethnic caste society" has erected certain barriers against a free social intercourse with those who do not subscribe to the concept of ritual purity and pollution. Despite these barriers, in present day

Nepal a "multi-ethnic caste society" has retained a flexibility which permits a limited social interaction between distinct ethnic groups and between Hindu castes and casteless populations.

Since the early 1980s, a vanguard of young South Asian anthropologists has expanded ethnographic study beyond the dominant preoccupation with the exotic and with historic origins, lending much needed diversity to the field. At present the concern with the pressing problems of development, the environment, and the role of women, and a somewhat Marxist focus on socio-economics and class differences, consumes a large portion of anthropological energy. The first two concerns are part of the larger theoretical context of this research, whereas the second two, along with caste, are variables which required more detailed discussion here.

Recent studies of gender in the developing word, and in Nepal, have been, almost without exception, studies of women's roles and responsibilities within the household and larger society (see Bennett 1983, Jones and Jones 1976), and of women's development needs (see Acharya 1979; Alva 1988; Bennett and Acharya 1981, 1983; Boserup 1970, Inserra 1988; Kandiyoti 1990; Kumar and Hotchkiss 1988; Palmer 1981; Pradhan 1980; Seeley 1989a, 1989c; Shrestha 1979; Siddiqi 1989a, 1989b, 1989c; Thrupp 1984). Very little has been written on gender, as it includes the roles, responsiblities, and needs of both men and women in rural households and communties. Most of the exceptions to this general rule are found in the anthropological literature or in works which employ the holistic anthropological perspective. Some of these are the works of Brokensha and Castro (1984) and Bruce and Fortmann (1989) on agroforestry and land tenure, Castro (1990) and Fisher and Gilmour (1990) on community forestry, Hansen and Erbaugh (n.d.) and Speth (1990) on the social factors of natural resource management, Mathias-Mundy et al. (1990) and Rusten (1989) on indigenous knowledge of tree resources, Reejal (1981) on gender and work, and Messerschmidt (1981, 1984, 1985, 1987, 1988) on a variety of anthropological and development related topics.

Class in Nepal is a fairly recent and still somewhat unexplored phenomenon owing to the dominance of caste factors in social interaction. Recent studies of the relationship between caste and class in Nepal and the importance of socio-economic factors in resource management have some shed light on this little explored variable. As class, along with caste and gender, was a major focus of my study of indigneous knowledge and resource mangement, I turned to the literature on class in Nepal. Important ethnographic insights were gained through the works of Bebbington (1981), Bista (1991), Fricke (1986), Nesmith (1991), Seeley (1989b), Subedi et al. (1991), and Antrobus (1989). These writings highlight the importance of socio-economic divisions and distinctions, along with those of caste and gender.

Thus far, I have reviewed the past and current trends in the literature, and given brief descriptions of the cultural and the natural diversity of Nepal. These discussions have created a larger context within which to place my research locality, discussed in the next section, and my central problem, discussed in the second chapter.

4. Lahchowk village

Agriculture is the main occupation in Kaski District, with a participation rate of over 90 percent. Rice, corn, wheat, and millet are the major crops; potatoes, soyabeans, squash, oranges, guavas, bananas, and pears are also grown. Farmland accounts for 38.3% of the land area of Kaski. Forests and shrublands account for 42.2% of the land area and grasslands and other land uses account for the rest, about 19.5% (Balla et al. 1991). The climate in Kaski District ranges from subtropical in the lower part of the middle mountains to alpine in the high mountain zone.

Lahchowk village is located 16 miles north-west of Pokhara town in the Kaski District (see Figure 1). The altitude of Lahchowk is about 4500 feet above sea level. The village is on a plateau situated above and below hilly areas. There are two rivers, the Mardi and the Seti, which intersect far below Lahchowk. To the north-east of the village, forested hills retreat to the distant Annapurna mountain range.

The population of Lahchowk in 1990 was 4,143 people in 816 households (Balla et al. 1991). Inhabitation of the area reaches as far back as 300 years, but the village of Lahchowk itself has its origin 200 years ago. Older men and women from the village supplied first-hand geographic and historic data about Lahchowk dating back as far as 1990 BS (1933 AD).

There are a number of different types of non-forest land in and around Lahchowk. **Khet** (irrigated land) totals 23.6 hectares and constitutes the largest part of village land. Most of this land lies outside of the main residential area but there are some **khet** fields found within the residential area as well. **Bari** (rain-fed land) farming is common within the mid-hills and in Lahchowk also. **Bari** land occupies the third largest area in the village - 13.7 hectares - following **khet** and homestead, and lies within the residential area, surrounding the homestead. Homestead are those areas which include the compound where the house or houses, cattle enclosures and barns, and homegardens for growing vegetables and multi-purpose trees are located.

Another type of land use found in the area around Lahchowk village is **khar bari**. **Khar** is a type of thatch grass, and **bari** refers to the fact that the land that **khar** grass is grown on is not irrigated. **Khar bari** covers most of the hilly areas below the forest proper and is also found on relatively barren areas. **Khar bari** can be owned by an individual, can be included in communal forest area - in which case use rights to the **khar bari** are determined by membership in a forest user group - or the area can be open to all villagers who wish to

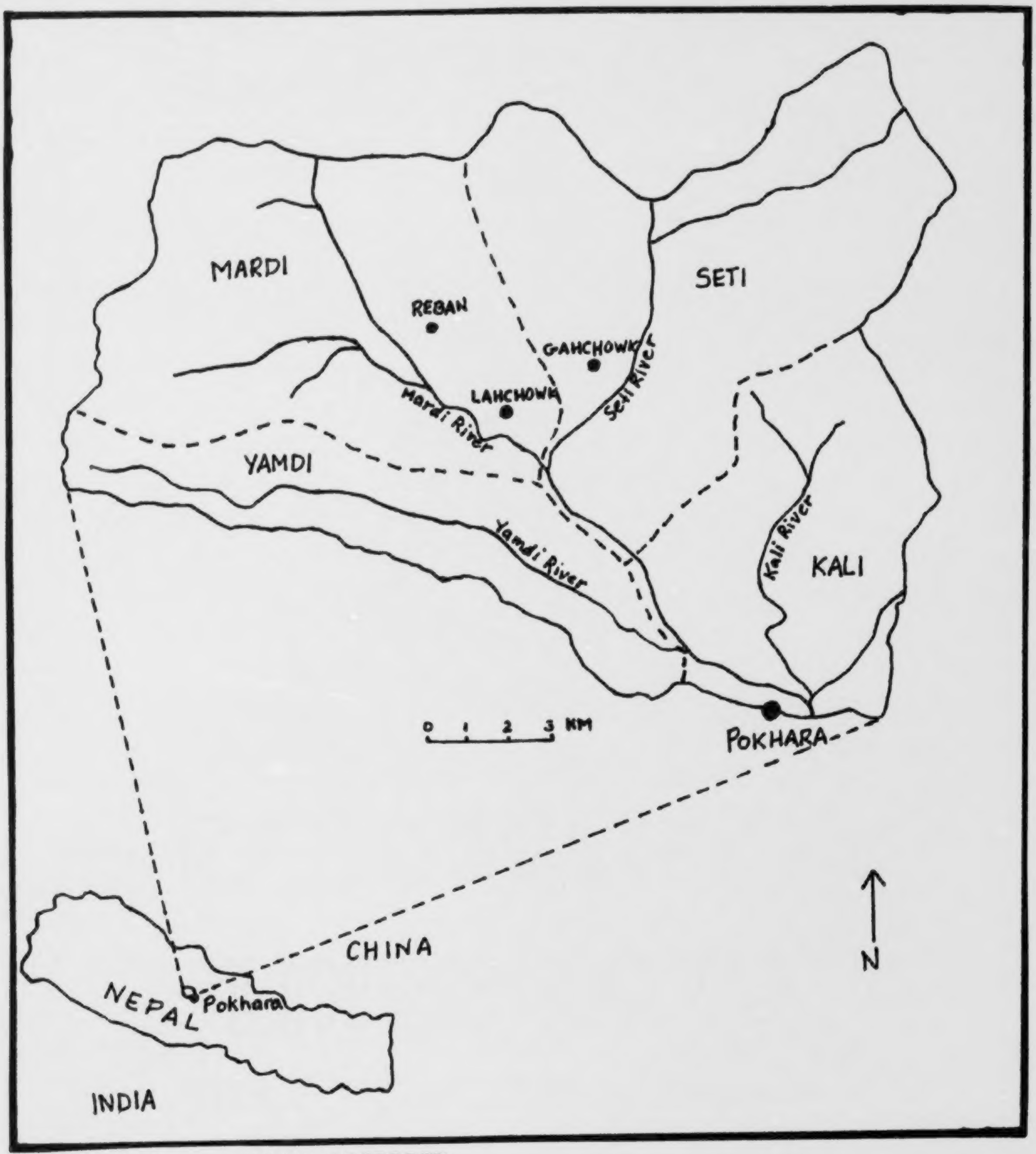
MARDI
SETI
REBAN
GAHCHOWK
LAHCHOWK
Seti River
Mardi River
YAMDI
Yamdi River
Kali River
KALI
POKHARA
0 1 2 3 KM
N
CHINA
NEPAL
Pokhara
INDIA

FIGURE 1 - KASKI DISTRICT

Map placing Lahchowk within Kaski District and locating neighbouring villages and towns.

use it. These categories of **khar bari** are rather fluid and disputes over ownership and use privileges are common. Villagers report that **khar bari** serves several purposes: thatch production for roofing, fodder for cattle, and erosion control.

The forests on the hills north-east of Lahchowk can be classified as three types: government forest, communal forest, and private forest. Around Lahchowk very little forest area is owned by the government. The only areas which fall under the heading "Government Forest" are the far away Lekh forest and the plantations around the communal forests. The closer forests are caste-owned forests - such as Thakuri Forest and Rana Bhat Forest - and private forests, such as Tirtha Bahadur Bhat Forest. Private forests are found mainly in privately owned areas where a family has planted or transplanted trees on barren land.

Thakuri Gaun is a "neighbourhood" of Lahchowk village which corresponds roughly to the government designation, ward #4. Villagers define themselves according to traditional **gaun**[3], rather than government designated wards (see Figure 2). There are 93 households which consider themselves to be part of Thakuri Gaun. Many of the neighbourhoods within Lahchowk are defined by caste, and only members of that caste live within that neighbourhood. Thakuri Gaun, despite its name, is a multi-caste, multi-ethnic neighbourhood, containing Thakuri, Gurung, Thapa Magar, Newar, Gharti Chhetri, Sunar, Sarki, and Damai households. Thakuri Gaun, then, is the functional "village" in terms of my own research, and the villagers' own perceptions of their community.

There are 35 Thakuri households in Thakuri Gaun, of which 33 are of "pure" Sahi Thakuri and 2 are of "mixed" Uchahi

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[3] **Gaun** translates roughly to the English word "village" or "hamlet," but in a large village it refers also to individual neighbourhoods.

Thakuri, according to the caste system. The Thakuri consider themselves to be of equal rank to Chhetri, slightly lower than Jaisi Brahmin[4] and slightly higher than Rana Bhat (although the Rana Bhat place themselves equal to Sahi Thakuri, and slightly higher than Uchahi Thakuri). Uchahi Thakuri have been in Lahchowk only 35 years, whereas the Sahi Thakuri have been in Lahchowk for more than 3 generations.

The Gharti Chhetri should also be given brief mention here. Although there is only one Gharti Chhetri household within Thakuri Gaun, 25-26 Gharti Chhetri households in an adjacent neighbourhood (ward #2) of Lahchowk have use rights to Thakuri Forest (discussed in the fourth chapter). The Gharti Chhetri consider themselves to be of equal caste status to the Thakuri. Behaviour confirms this, for, although there are no arranged marriages between members of these two castes, elopement is common and the families of both parties accept the marriage as legal and even desirable under Hindu caste law.

The second largest caste group living within Thakuri Gaun is the Sunar. Sunar can be described as a sub-caste of, or joint caste with, the Kami caste. Kami within Lahchowk are blacksmiths, whereas the traditional occupation of the Sunar is goldsmithing. Both Sunar and Kami are classed as occupational castes, and along with Sarki and Damai are the lowest castes in the village.

Despite this classification, Sunar villagers within Thakuri Gaun are more wealthy and influential than the Sarki and Damai. Some Sunar in Thakuri Gaun are relatively land-rich, owning their own **khet** land. One Sunar man owns not only his own **khet** and **bari**, but also **khar bari** land. Discussion with other Nepali researchers and scholars suggests that the relative wealth of the Sunar within Thakuri Gaun is not a

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[4] "Jaisi" is the term used for the offspring of irregular unions between Brahmin men and women.

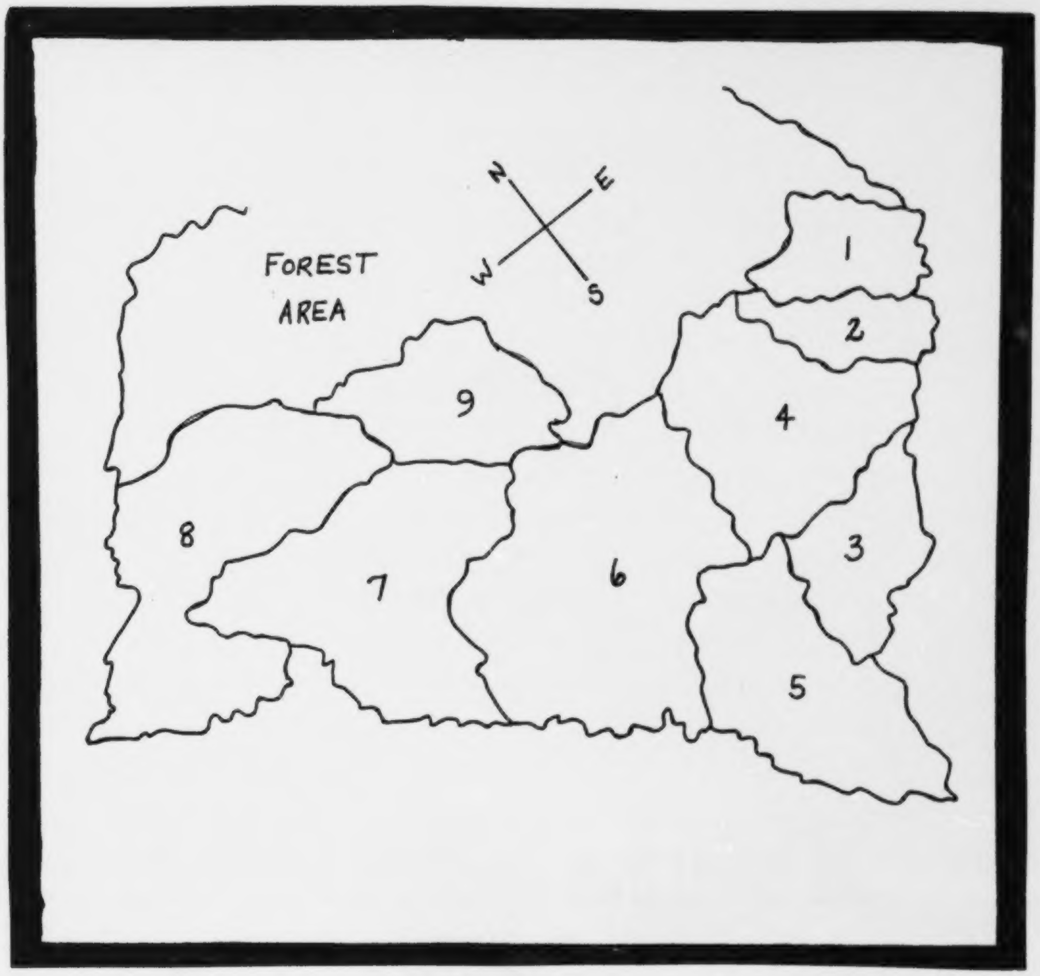

FIGURE 2 - WARD, NEIGHBOURHOOD AND CASTE IN LAHCHOWK

Ward #1: Rana Bhat Gaun; Rana Bhat
Ward #2: Gharti Chhetri Gaun; Rana Bhat and Gharti Chhetri
Ward #3: Kami Gaun; Kami, Sarki and a few Gurung
Ward #4: Thakuri Gaun; Sunar, Sarki, Damai, Thakuri, Magar, Newar, Gurung
Ward #5: Dhakal Gaun: Brahmin and a few Gurung
Ward #6: Bahun Gaun: Brahmin
Ward #7: Bahun Gaun: Brahmin
Ward #8: Sunar Gaun: Sunar and a few Gurung
Ward #9: Poudyal Gaun: Brahmin

generalizable pattern throughout middle hill villages. Any oneof the occupational castes is equally likely to be more influential than the others. One of the main deciding factors as to which group or groups will be powerful is internal leadership.

There are 14 households of Damai within Thakuri Gaun. Damai is an occupational caste; the traditional work of the Damai is tailoring, although they are also village musicians who play at religious festivals, holidays, and such occasions as weddings. Over half of the Damai households in Thakuri Gaun still practice these traditional professions to some extent, though none depend on tailoring and playing music exclusively for its livelihood. Most Damai do not own their own **khet** (and many do not even possess sufficient land for **bari**); they must obtain rice through the **adhiya** system[5].

The Sarki are a very small group within Thakuri Gaun, comprising only three households. Sarki is an occupational caste; the traditional Sarki occupation is leather work, seen highly polluting under Hindu caste ideology. The male household head in each of the three families works primarily in the fields of others, and in house construction within the village. The making of baskets and mats is also an important supplement to family income for two of the three households. None of the households owns any **khet**, but they all have **bari** land around their homes. The Sarki are striving to be self-sufficient, to escape their dependence on the Brahmin engendered by the **adhiya** (see footnote, page 24) system. Although maize and millet are low status foods, all three Sarki households subsist on these cereals - which they produce on their **bari** land - for several months out of the year in order to save money.

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[5] The Damai of Lahchowk regularly work in the fields of other villagers, particularly Brahmin. The Thakuri Gaun Damai have **adhiya** relationships with Poudyal Brahmin. These are not family or household ties, and last for one cropping season only. The Damai workers get a portion of whatever crop they are harvesting in return for their labour. Because most of the Damai do not have their own **khet**, the **adhiya** system provides their families with rice. A Damai man explains why working **adhiya** is not highly profitable for the workers: **Ik hal goru** (the amount of land plowed in one day by one man and one oxen) produces 3 **muri** (a measurement of grain, see Appendix A for definition) of rice - 1 1/2 **muri** each to owner and worker. But the principle worker must hire six others to help him work the fields, and he is responsible for their renumeration (300-400 rupees total) and one meal of rice and vegetables to each worker. It is often not worth his while financially to do this. The Damai man stated that the 1 1/2 **muri** of rice that he receives as payment does not cover his costs.

There are two households of Newar within Thakuri Gaun, but these two households contain the members of three families. After a woman with a husband and children died, the husband's sister and brother-in-law agreed to merge the motherless household with their own. It is difficult to generalize when discussing the Newar in Thakuri Gaun: one household is quite wealthy and owns a substantial amount of **khet** and livestock; the merged household, however, is considered to be poor because it has no **khet**, only two cattle, and the head of household male must work for others in house construction and field work in order to have enough cash. Unlike many Newar in Nepal, the Newar in Thakuri Gaun are not engaged in business.

The Thapa Magar in Thakuri Gaun comprise three households, all within one large compound. Thapa Magar are an ethnic group rather than a caste within the Hindu caste system but, like the Newar in Thakuri Gaun, they practice Hinduism. The three related households of Thapa Magar have become quite affluent of late, due to the sons of the families going to India to work in the army and in other well-paying jobs. The only television set in Lahchowk belongs to one of these families, and they charge villagers two rupees each to watch television. The Thapa Magar possess both **khet** and **bari** land. All Thapa Magar children, male and female, attend school.

The Gurung are believed to be ethnic-Tibetan people who settled in the high hill and mid-hill areas of Nepal many years ago. The Gurung in Thakuri Gaun are of the Ghale lineage; they practice Hinduism and speak Nepali. There are only three households of Gurung within Thakuri Gaun. There are 10-12 Gurung households in Lahchowk, however, and all of them are related through consanguineal and affinal links.

The ethnic and caste diversity within Thakuri Gaun allows for contrast to and comparison with other middle hill villages. Although this amount of caste/ethnic diversity is not common within such a small residential area as Thakuri Gaun, mid-hills communities do tend to include more than one ethnic group. The households within Thakuri Gaun also divided equally into two groups of villagers: upper caste/ethnic households and occupational caste households, which allowed for sound statistical comparison. This was an especially important division in terms of forest use rights, management rights, and indigenous knowledge. The implications of these social divisions within the community extend beyond the boundaries of the village itself, and influence the relationship between people and their natural resource base.

What is perhaps most important, however, is that my research is generalizable beyond mid-hills Nepal. There are social divisions of some kind in all communities, be they ones of caste, class, clan, lineage, age-grade, or gender. The high degree of ethnic and caste complexity within Thakuri Gaun provided an excellent environment in which to explore socio-cultural conflicts over resources, and differences between groups in knowledge and use of the forest.

CHAPTER II
THE EVOLUTION OF THE PROBLEM

This chapter describes the interaction between researcher and problem before, during, and after the field experience. My hope is not only to communicate something about the evolutionary process of my research, but also to provide important background information which shaped my thoughts and ideas and, hence, the direction that this thesis took.

The chapter begins with the conception of the problem I took to the field. My interests were in the area of resource management, particularly gender difference in access and knowledge. I was also interested in the role that development activities and other culture change processes play in resource use and management. I became interested in these issues, and in my specific problem, through background research in Himalayan ethnography, development anthropology, social forestry, ecological anthropology and indigenous knowledge.

The majority of this chapter chronicles the transformation of my problem, through the utilization of different field methods and various theoretical perspectives. It is an exploration of how my problem/focus evolved/changed during my own search for ways to accurately and adequately describe and explain my data, and for explanations which would provide me with a deeper understanding of the villagers' interactions with their environment. Finally, I will discuss the units of analysis that emerged during field work, and the importance of these units for this and other research.

1. Applied Anthropology

What does anthropology, the study of human culture, have to do with social forestry development? Although social forestry itself is a fairly new concept, the link between anthropology and development is not a recent one. Since the

1950s, anthropologists have worked in international, crosscultural technical aid programs (see Erasmus 1961, Goodenough 1963), and as early as the 1960s "applied anthropology" was recognized as a sub-discipline of the field of anthropology. Foster wrote in 1969 that anthropologists who work on directed culture change programs whose goals have to do with the social and economic problems of contemporary life, rather than with descriptive data and basic theory about culture and society, are referred to as "applied anthropologists" (1969:13). "Applied anthropology" then is the utilization of the theoretical concepts, factual knowledge, and research methodologies of anthropology in programs meant to ameliorate contemporary social, economic, and technological problems (Foster 1969:vii).

a. The anthropology of development

The role of anthropologists in development has often been problematic. In many cases, development practitioners - who have traditionally relied almost solely on empirical data, hard scientific evidence, and objective decision-making - rejected the work of social science, and anthropology in particular, as irrelevant, unprovable, and unnecessary for development. Another barrier to the acceptance of anthropological contributions to development was the relatively low status accorded by many anthropologists to applied anthropological work. Thus the applied research of anthropologists was frequently viewed by both developers and other anthropologists as somehow less profound, less vital.

Mardsen writes that the "arrogance with which policy makers and planners assumed that they were writing in a **tabula rasa** as they intervened in the Third World in the name of development is being replaced by a reflective understanding of the partiality of their own knowledge and a heightened appreciation of the value of other ways of perceiving the development task" (1991:32). Out of the critical concern for the way development has been done in the past, a new definition, a "new paradigm", a new **bikas**[6] has emerged (Messerschmidt 1990). The new paradigm has encouraged such slogans and sayings as: "putting the last first" and "farmer first" (Chambers 1983; Chambers et al. 1989).

This new way of thinking about development is described by Messerschmidt (1990) as a "professional revolution", one that espouses "people's participation", seeks to learn from indigenous knowledge, and advocates "bottom up" development. This is highlighted by, but not confined to, current attempts to focus on processes rather than products of development, to incorporate the traditional objects of development (women, the poor) much more centrally into planning and implementation, to institutionalize reversals in decision making, and to understand the complexities associated with micro-environmental and contextual changes (Mardsen 1991, Chambers 1983). Current attention focuses on devising sustainable development strategies which are self-reliant and participatory. The assumption is that people can, if given access to resources and opportunities, devise viable strategies for technical and social development.

This paradigmatic change in thinking, which transforms "objects" of development into "partners" in development and which recognizes that indigenous cultures are not a **tabula rasa**, is not really a recent realization, despite the label "new paradigm". Over two decades ago, Foster wrote that applied anthropologists adhere to the premise that

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[6] **Bikas** is a Nepali term which, broadly translated, means "development". But the term **bikas** also suggests a way of thinking about development and doing development. It is perhaps more accurate in the context of this thesis to translate **bikas** as "development paradigm".

> ...in order to direct change most successfully, build on what already exists... assume a logical explanation for all behaviour ...even though, with the passage of time, reasons that were once valid may no longer be well suited to contemporary needs...applied anthropologists try to find the institutions and customs which have growth potential and which can serve as a base for innovation (1969:67).

In essence, what has happened is that an old idea has finally caught fire. Cultural relativism, holism, and systemic thinking have finally penetrated into development theory. The anthropological approach has become acceptable. The recognition by developers and policy planners that capacities for change and innovation are embedded in cultures, reflected in individual strategies and organized actions, and transformed through internal dynamics and wider politico-economic processes (Bennett 1976, 1988; Acharya 1990) has encouraged sensitivity to cultural, social, individual and historical dimensions of each development issue. "For these reasons, village-based and small-scale programs...that... directly work with and benefit the local people are always preferable to larger, time-bound, and rigid projects" (Acharya 1990:354). Village-based research which involves a close relationship with and understanding of the local people is the traditional domain of anthropologists. Thus the recognition of the central role of culture in development has lead to the acceptance of "development anthropology" as a term referring to the involvement of social anthropologists in planned attempts to encourage social and economic development, particularly (but not exclusively) in the Third World (Brokensha 1987).

At the heart of the anthropological development approach is cultural ecology - an attempt to understand the ways in which human relations affect the relations between humans and nature, and how the results affect human systems and ecological systems. Development anthropology is an approach that examines the processes of interactive cultural and ecological adaptive change from a holistic (relations of systems), comparative (global), and evolutionary (historical and futuristic) perspective. It is important to stress that while development is one of the most compelling issues of our age, it is really only an extension of the same process of adaptation in which all human groups have always been engaged (DeWalt 1988).

Academic concern with indigenous technical knowledge dates back at least as far as the first intensive fieldwork by anthropologists. Studies from the sub-fields of cultural ecology and ethnoecology within anthropology produced some of the first accounts of the richness of tribal and small-scale taxonomies and environmental management systems. But only recently, with the heightened concern for the loss of not just species but indigenous knowledge and the recognition of the richness of such knowledge, has the possibility of using indigenous knowledge as a basis for development activities been entertained. Howes states that "...the perceptions of indigenous observers are not only superior to those of the scientist as far as the identification of individual species is concerned, but...this superiority also extends to the empirical understanding of localized eco-systems as a whole" (1980:343). Indigenous knowledge will be discussed in more detail in later chapters.

The present conditions in the international system are making people in developing countries not only poorer in economic resources, but also poorer in knowledge. And, what is perhaps worse, it is also making them poorer in the confidence with which they could continue to create knowledge.

> If indigenous management is about utilizing local, folk or vernacular knowledge and organizational methods, in the services of more appropriate development strategies, then it is important to investigate how that knowledge is gained and interpreted, what that knowledge is and how it might be most effectively used. Knowledge is a key asset in securing control and thus any discussions about it must necessarily recognize the political dimensions of its use (Mardsen 1991:36).

Before any intervention in use and control of natural resources, planners need to be aware of what local people actually do, what specific sorts of knowledge they have, and what their needs are (realizing that each community is divided, by rank, age, gender, caste, ethnicity or religion, and different people have different needs). Development implies an improvement in the existing situation. Unless this situation is carefully studied, development programs may be wasting resources in repeating what local people are already doing, or asking people to do what they think is wrong, less important, or unaffordable (Acharya 1990).

> Too often the ecological and socio-economic conditions of the target area have not been compatible with the project plan assumptions, and the desired results could not be achieved on a sustained basis...By dismissing indigenous knowledge as irrelevant, rural people may be encouraged to adopt practices that lead to undesirable effects through the inappropriate use of local resources. The new techniques [or organization] may also undermine the delicate balance of the local culture or natural environment, causing declines in social welfare (Warren and Cashman 1988:8).

Thus the involvement of anthropologists and the anthropological perspective is critical in development activities. Anthropological concepts are fundamental to understanding the human dimensions of development. Anthropology brings with it an appreciation for the value of understanding ritual and belief, social structure and organization, residence and inheritance rules, and customary law and practice (Messerschmidt 1991). Only by recognizing - and documenting - local cosmologies, traditions, adaptations, and management strategies can planners can use this rich knowledge as the basis for more effective planning for natural resources and people.

b. Social forestry and the new bikas

Although forestry in Nepal will be discussed in some depth in the next chapter, it is important here to explore the methodological and theoretical underpinnings of social forestry that influenced both my choice of problem, and the way in which I approached my problem.

In the above section, I introduced the idea of a new **bikas** (see footnote, page 29). The new **bikas** affects all development sectors, including forestry. Gilmour and Fisher (1991) speak of a change from a technocratic "forest-centred" approach to a participatory new "people-centred" approach. This paradigm shift represents a very significant change in forest policy and practice.

Social forestry is a rural development initiative that was formulated in response to a perception in the international community in the mid-1970s that there existed a rural energy crisis in the developing countries. It was part of the wider movement in development thinking away from large scale projects, away from a faith in trickle-down effects, and away from urban industrial development to benefit the poor. The focus on community forestry is one of the manifestations of the trend towards people's participation, local level development, and the targeting of the rural poor.

Social forestry has been called a form of "anthropological forestry" (Messerschmidt 1990): it is a natural extension of anthropology's interests in indigenous knowledge (an outgrowth of ethnoscience, ethnoecology and ethnobotany), social organization (especially traditional systems of resource management) and community property resources. Social forestry can be defined as forestry with and by local people, in whole communities, in small groups of users, or as private owners and growers of trees.

In Nepal, social forestry has been seen as a way to meet the challenge of the fuelwood crisis and also as a start in the task of forest regeneration in an increasingly deforested area of the Himalaya. Hansen and Erbaugh cite a Ford Foundation policy statement when they write that both

> ...in theory and in practice, the success of social forestry programs requires the participation of the people in planting and protecting trees and in the equitable sharing of benefits. At present, forest departments are the main implementors of social forestry programs...community-based and intermediary organizations are also needed. Non-governmental initiatives can generate innovations in participating community organizations, in designing incentive systems and support services, and in popularizing social forestry for the needs of the people (n.d.:88).

This type of social forestry requires viable social contracts, such as "contracts" between communities and collaborating outside agencies, among members of participating groups, or between groups of participants and the community at large (Rocheleau 1987b). Both formal and informal social contracts have existed and do exist as part of the institutional and organizational structure of small-scale communities. The recognition of these existing contractual systems has led to a renewed interest in indigenous management practices, in the belief that they may be the bases for building more sustainable development strategies because they are designed to meet local needs and are embedded in the local culture.

The current paradigm shift towards an increased incorporation of anthropological techniques in agriculture and forestry development, and the utilization of indigenous knowledge in planning projects and interventions, is fraught with difficulty and dilemma. Among the things that plague this shift, and development in general, is a lack of serious intent to pursue the real purpose and meaning of the enterprise - benefitting the people (Messerschmidt 1991).

Development, according to Niamir (1988) should raise two questions: 1. is it moral, i.e. does it treat people with respect for their integrity; and 2. are the proposals practical and do they work? To answer "yes" to both of these questions, we need to understand the local indigenous knowledge system. A prime goal of all development policy must be to preserve and promote cultural strengths (indigenous knowledge) not only for humanistic and moral reasons but also for efficiency and pragmatic reasons.

Management of natural resources is one of the prime development concerns in Nepal because of its critical importance in maintaining the mountain ecology and its connections with other sectors of life. My research in the field of social forestry and my interactions with social foresters from the Institute of Forestry in Pokhara lead me to believe, however, that it is the management of people that holds the most potential for meeting this development concern. It follows that development policy should be built on the conditions, capacities, and active participation of local people (Acharya 1990; Chambers and Howes 1980; Brokensha, Warren and Werner 1980; Howes 1980; Warren and Cashman 1988; McNeely 1988; Rocheleau 1987b; Woodley 1991).

Social forestry involves both a shift in thinking and theory, and a change in how "outside" professionals interact with villagers on a practical level. Research which explores human ecological relationships that exist between tree resources and Nepalese farming systems, and important socio-cultural and economic variables that influence forest management and forest resource utilization practices, has had its underpinnings in a number of general theoretical perspectives of natural resource management. It is to a brief description and analysis of these that I now turn.

c. Theoretical approaches to natural resource management

This section presents an encapsulated look at the dominant theories that are used to explain natural resource management in Nepal. The effect that these varying approaches have had and currently have on the relationship between local people and their natural resource base is profound, and must be explored in order for the present situation to be understood.

According to Acharya (1990), with respect to the efficacy of natural resource management systems, three major theoretical approaches are current in the literature. The first approach represents what Hardin (1968) called "the tragedy of the commons." The tragedy of the commons assumes that under conditions of open, uncontrolled access to common resources, people will exploit the resources competitively thereby destroying them. Adherents to this approach maintain that the existence of private interests and competition does not allow local communities to manage commonly held resources efficiently and sustainably. In keeping with this theoretical perspective, Wallace (1987, 1988), Rieger (1981), and Eckholm (1975b, 1976) argue that Nepalese communities are inherently incapable of managing their natural resources well.

Traditionally the Nepali government proceeded on the assumptions inherent in this approach. The government held that it was more capable of deciding on behalf of the people and managing local resources for the benefit of local communities than the local communities themselves. In the 1950s, Nepalese administrators, politicians, and academicians believed that villagers were so ignorant and trapped by their superstitious customs, beliefs, and traditions that they lacked motivation and ability to "adopt" scientific innovations made available by the government for their own benefit (Acharya 1990). However, anthropologists who did research on social change and acculturation uniformly came to the opposite conclusion: namely, that external intervention in local matters tended to disintegrate or dislocate the "traditional" cultures' organizational structures, with the result that, among other impacts, valuable natural management systems were damaged or destroyed (Furer-Haimendorf 1975; Bennett 1976; Gilmour and Fisher 1991).

The second approach, generally labelled "neo-functionalism" (Orlove 1980), derives from the belief that societies have mechanisms and institutions which enable them to regulate and adapt to changing natural and cultural environments. This approach emphasizes that local communities are highly efficient in managing their natural resources and maintaining their population within the limits of their natural environment (Rappaport 1968, Vayda and Rappaport 1968). Influenced by this theoretical orientation, brief studies conducted by Messerschmidt (1984), Arnold and Campbell (1986) and Molnar (1981) have documented some of the methods developed by local communities to manage their natural resources well, even in the midst of constraints imposed by state legislation and bureaucracy.

A third approach, variously labelled "problem approach" (Vayda and McCay 1975), "actor-based model" (Orlove 1980), "adaptive dynamics" (Bennett 1976), "policy-relevant cultural ecology" (Bennett 1976), and "processual ecological anthropology" (Orlove 1980), essentially maintains that all kinds of actors have certain capacities as well as limitations for managing natural resources, and the existence of problems is as normal as the tendency toward maintaining order. This approach stems from the increasing recognition that the ecosystem is an analytic, not a biological, entity; that natural selection acts not upon it but rather upon living individuals; and that the interactions regarded as self-organizing properties of ecosystems could be understood instead as the products of the various and variable adaptive strategies of individual organisms that live together in restrictive spaces and are subject there to various stresses and external disturbances (Vayda 1983).

This approach encourages attention to the behavioral rather than normative aspects of social life and to the ways in which responses to changing circumstances are made by particular human beings, acting either together or separately and making use of whatever technological, organizational and cultural means are available to them (Bennett 1976). Individuals make observations of the real world, set up conceptual models of reality to interpret these observations, and use these interpretations to formulate hypotheses of future events upon which to base their decisions about future activities[7].

In Nepal, studies of user groups of forest resources - smaller units which make decisions concerning forest management - are one of the main outgrowths of this theoretical perspective. These studies focus on adaptation, innovation, and both perpetuation of and deviation from traditional management strategies, and draw upon ecological anthropology theory, which proposes that social and behavioral features of a society are very closely involved in how the environment is utilized. The important relationship between human cognition, behaviour, and environment has long been the subject of study by anthropologists.

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[7] This is referred to as "cognitive mapping" (Atte 1989). Cognitive mapping is a means of adaptation which structures human operations in the environment. According to Atte, it deals with two types of information: a.) local information: to accurately encode, store and decode information about the location, direction and distance of phenomenon in the environment, and b.) attributive information, which is both i. descriptive - quasi-objective or denoted, and ii. evaluative/connotive - the assignment of meaning, value, and attitudes to phenomenon - physical and cultural.

When dealing with complex social and natural environments, the use of any one model to the exclusion of all others limits any possible understanding of the dynamics of the system. However, the third approach discussed above is sufficiently broad to embody aspects of the other main approaches without compromising its major tenet. Whether it is called cultural ecology or adaptive dynamics, this approach reflects and allows for the enormous repertoire of adaptive behaviours I observed in Lahchowk community, and allowed me to place these behaviours within the dynamic system of human-environment interactions. It is this recognition of the contribution of individual action to cultural adaptation which I found so useful when examining individual behaviour, decision-making, adaptive patterns and conflict within Lahchowk village. And it was this recognition that guided my discovery of appropriate units of analysis within Thakuri Gaun.

2. Theory on the ground

Anthropological research most often looks primarily at the village or community unit, then remains fairly open-ended in regard to the smaller units of analysis such as lineages, clans, age-grades, and a variety of co-residential units. The new working unit of analysis for social forestry in Nepal, on the other hand, is the "user group," the group of people who have recognized title to manage and utilize a specific forest area. To confuse the situation further, the development literature suggests that there are two main actor-oriented approaches: the household level study and the village level study (Wiersum 1989).

When I first went to the field, I attempted to incorporate all of these approaches by looking at Thakuri Gaun as one unit of analysis, households as another, and the "user group" - as defined by social forestry - as yet another. This soon became confusing. I began to realize that people who had knowledge of the forest were not of a certain household, or village neighbourhood, or official "user group." This conclusion lead me to focus, instead, on individuals within Thakuri Gaun. Work with villagers over several months revealed that individual knowledge, and patterns of exploitation, are influenced by gender, age and socio-economic standing[8]. These were the units that I worked with: groups of individuals which shared gender, age, and socio-economic standing and, hence, exhibited similar exploitation patterns and possessed similar knowledge.

While the Himalayan literature has described a multitude of caste and ethnic group differences in economic and ecological exploitation patterns, very little literature has dealt with caste and ethnic group differences in exploitation of the same resources. In addition, while a number of studies have explored women's work versus men's work, few studies have investigated social group and gender as cross-cutting factors (see Bennett and Acharya 1980). The "user group" as a unit of analysis in social forestry focuses on the group of people who have rights to manage the forest, rather than the actual group of people who use the forest.

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[8] I remember the morning in early November when this realization came to me. I was pouring over data from the previous month with my research assistant. I idly asked her, "Did you know that all of the Sunar women we talked to recognized this medicinal herb? How many Thakuri women knew it? Can you check the tables?" After a brief pause and shuffling of paper, she replied "None". And in my mind, I said "Eureka, a pattern!"

The forest use situation in Lahchowk forced me to go beyond the traditional and bounded definition of the "user group" and work with all forest users, those with formal rights of access and those with no formal rights of access. This enabled me to assess the various existing types of local forest use with their related utilization systems; to assess who has the basic control over or ownership of these different forest-use types (private people, community or caste group, state); and to identify the various groups of the population who have **de facto** or **de jure**[9] user rights and management responsibility for the different forest areas and resources.

Through the use of flexible units of analysis based on factors such as gender, age, socio-economics and user status, it was possible to identify whether either cooperation or competition between various groups in utilizing forest resources is taking place, and whether there are discrepancies in the formal management situation and the actual forms of forest utilization by different groups within the village. This approach enabled me to evaluate the dynamic nature of various forest utilization and management systems: for instance, how local people have adapted their indigenous land-use strategies in response to changing socio-economic and institutional conditions.

Glaser and Strauss (1967), and Spradley (1979) take somewhat radical approaches (at the time and even now among some circles of professionals) concerning field research. They suggest a broad and flexible theoretical framework and advocate that researchers should enter the field as nearly **tabula rasa** as possible - without any preconceived theory that dictates relevancies in concepts and hypotheses. These authors do, however, recognize the need to have a general sociological perspective, questions of interest, and a focus.

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[9] See Appendix A for a glossary of English and Nepali terms used in this thesis.

Based on Spradley's (1979) description of research with informants, the indigenous knowledge literature (especially Messerschmidt 1991; Rusten 1989; Klee 1980; Chambers 1992; Balla et al. 1990) and work on natural resource management and decision making (especially Bartlett 1980; Mathias-Mundy et al. 1990; Arnold and Campbell 1986; Fisher 1989; Gilmour 1989; Brokensha and Castro 1984; Mardsen 1991), I formulated a number of general questions which I hoped to address during my research. Only after several months in the field - as I gained a deeper understanding of the concepts, theories, and knowledge of the villagers - did a number of hypotheses begin to take shape. My initial queries were:

1. What do women know about the forest and the management of this resource; and are there gender-specific domains of knowledge concerning forest resources? These questions are based on the realization that divisions of labour based on gender are common in rural Nepalese households (Bennett 1983; Molnar 1981).

2. Is there a system (or systems) for the classification and/or evaluation of fuelwood species, and if so, what is the character of this system?

3. What are the stated perceptions about the use, preference, and management of fuelwood species. What actual actions, both formal and informal, are taken by people and groups to manage fuelwood and other forest resources?

4. Who are the primary knowledge-holders concerning forest and fuelwood resources, and how does this effect management and the quality and availability of these resources? Will the variables: fuelwood demand, land size and character, access to public sources of fuelwood, caste, gender, family size and composition influence Indigenous Technical Knowledge (ITK)?

5. What variables influence ITK, and what is the nature of the relationship between these variables?

The first set of queries presumes that gender might be an important variable with respect to knowledge systems and perceptions of fuelwood resources. It was later hypothesized that men and women would share common domains of knowledge and perception about fuelwood use and management, as well as have unique gender related domains of knowledge and perception. Identification of such gender related differences in perception and knowledge can help in the design of extension activities and other development problems. This is especially important for development efforts that may effect resource use among different segments of a population.

The complex mix of unique and common domains of knowledge alerted me to the necessity of carefully evaluating personal, and commonly held, assumptions concerning differences between men and women with respect to perception and knowledge systems of the environment. It may be specifically important to stop articulating gender related issues in terms restricted to women's issues, and take a broader and more holistic perspective of gender related issues (Rusten 1989), as I attempted to do in my research.

While I recognized that there are important gender defined differences in household labour allocation and decision making, the realization of these differences is often modified by household idiosyncracies and the realities of daily village life. A classification of domains of knowledge based on gender alone is far too simplistic. In order to gain an understanding of knowledge differences, I had to consider the influences of a number of interrelated factors - gender, age, caste, education, settlement pattern, socio-economic variables - on the perceptions and actions of community members.

This section has discussed the theoretical approaches and the practical realizations that shaped my own thoughts and actions both in the field and as I was writing up my findings.

I suggest that the existence of a sophisticated forest knowledge system - shared in whole or in part by community members - to identify, evaluate, and procure forest resources lends no credence to theoretical models (such as the "tragedy of the commons" and feminist models) which deny any form of cooperation between resource users. Nor can the existence of these systems be fully understood by utilizing neo-functionalist models which have difficulty explaining conflict between resource users. Resource utilization and management takes place at a number of different levels - individual, gender, age, socio-economic - and there is both cooperation and conflict within and between these levels.

My research in Lahchowk was an attempt to document, describe, and understand a resource management system through the perceptions and actions of the individuals within the system. The general problem that I entered the field with, and the subsequent specific questions that needed to be answered in order to understand the problem, in part dictated the methods that I used to collect data. The methodologies that I used, in turn, elicited data which influenced my problem focus. The following section describes and discusses these methods.

3. Methodology

I had only a relatively short amount of time in the field and a specific research problem. I tried as much as possible to employ traditional anthropological methodologies such as participant observation, semi-structured interviews and topical interviews, but for certain kinds of very specific data sets I felt the need to go beyond this. I took the anthropological group interview a step further and allowed the group members to structure the presentation and analysis of their own data. Many anthropologists have done this, but it was particularly important for my research because I was trying to discover the knowledge of specific groups within the community, rather than the knowledge of the community in general. Allowing groups of occupational caste women, or older Thakuri men to present their knowledge using their own categories was more important than eliciting specific knowledge from individuals on subjects that I felt were important, although I did this as well.

Anthropological methodology typically employs a holistic perspective, exploratory field work and flexibility. My focus on obtaining an understanding of the local peoples' knowledge and management systems required a variety of techniques, both traditional and more innovative. The following is a narrative presentation of the methods I used in the field, and a discussion of how these methods influenced the evolution of my problem.

My first data gathering "methodology" was an extensive literature review, undertaken in the year preceding field work. Subjects investigated ranged from Nepali history and the workings of the caste system, to women in development and social forestry. Secondary data proved useful in the field to frame and evaluate initial hypotheses, topics, sub-topics and questions. A second, follow-up data search was conducted after leaving the field. The work of other researchers provided a rich basis for contrast and comparison and enabled me to see Thakuri Gaun in relation to other middle hill villages in Nepal and other small-scale communities experiencing resource conflict. The data from Thakuri Gaun was also placed within the larger contexts of gender and caste issues as discussed in the literature.

My first few weeks in the village coincided with Dasai, the Hindu equivalent of Christmas. This was the perfect time for my entre into the village because it is such a social and relaxed time in the Nepali calendar. I spent this time visiting villagers in their homes, entertaining in my own home, and improving my grasp of the language. As well as rapport-building, I was engaging in what all anthropologists do in the field, participant observation.

In essence, the key element of participant observation is spending time living in a community, making direct observations and discussing these observations with community members. The researcher participates in the life of the community and the community participates in the work of the researcher. Rusten (1989) writes that indigenous knowledge systems are often so tightly integrated within the whole complex of a culture that isolating them for study becomes both artificial and futile. Developing an understanding of an indigenous knowledge system demands that interpretation of identified elements of such systems be carried out within their cultural context.

Early on in my research, participant observation allowed me to record and take part in the activities of villagers in a relaxed and unobtrusive manner. I would observe the application of a practice and describe it, noting its unique features, the actors involved, the conditions under which it was used most often, and the user's assessment of its effectiveness and limitations. Later, I would ask questions which were modified by what I had already observed and learned. Assumptions were continually corrected as new information came to light.

Every observation is potential data, and I spent much time simply observing villagers in the forest and utilizing trees on their own land, making kindling, and preparing the fire and cooking, etc. Direct observation is important because it often brings new insights and suggests new questions. Direct observation was used to verify information as often as possible. It served as a sort of "reality check" on data gathered by other means (Messerschmidt 1991).

Taking an active part in activities is equally important because one of the best ways of learning is by doing. Much informative learning took place when I was working with villagers at their daily tasks, such as gathering fuelwood and fodder, making mats, and collecting water. These activities provided both appropriate context and a relaxed atmosphere for questioning and learning.

After my first several weeks in the village, I had gained both more confidence and some idea of the specific topics I wanted to investigate and questions I wanted to ask. I decided to employ direct conversation with those villagers in Thakuri Gaun whom I talked with during the initial months of field work, in order to gather more information on general community and forest topics before engaging in more focused interviews. As I encountered villagers on my daily morning "walk-abouts" I would interview them informally. I also accompanied women on trips to the forest in order to obtain a clearer picture of forest utilization practices. I continued to return to this type of broad, casual investigation throughout the research process to verify information and when I embarked on a new topic.

I found that discussions about family members, occupations, number of cattle, amount of land, income, etc, were part of the rapport-building process. People wanted to know about me, and for me to know about them, before embarking on more focused discussions of forest use and management. This facilitated the recording of socio-economic and demographic data. I started with a mental checklist of the sort of things I wanted to know about the household and its members but, although the interview usually included all of these points, the order always varied according to the situation. The interview often took another direction as I responded to interesting leads that arose during discussion.

As Messerschmidt (1991) points out, the object of a socio-economic questionnaire is not to obtain detailed quantitative data from a random sample, but rather to systematically build a picture of the local situation based on the dialogue around a series of questions. This type of information is extremely important explanatory data and was referred to regularly during analysis.

Interviewing is essential to anthropological data collection. After collecting general information through participant observation and direct conversation, I turned to the semi-structured interview for more detailed data. The focus of these interviews was a set of questions and subtopics that reflected hypotheses that I had generated during the first months in the village and wished to test and explore further. Not only verbal answers were important, but also non-verbal cues and nuances that sometimes accompanied an answer. I recorded opinions, ideas, arguments, and jokes as well as names of items or categories in the subject of interest, noting indigenous terms and forms of categorization. As the interview progressed, I was always looking for new, unanticipated topics and questions to explore.

As well as semi-structured interviews on certain topics, I also engaged in a number of "directed walks" and "tours" to elicit information on specific topics. This type of activity was often difficult to coordinate because of lack of time on the part of the villagers. Many people were willing to cooperate, however, if I showed sufficient interest and was persistent. Several group walks around home gardens and fields provided valuable species inventories and descriptions of planting and management techniques. Also valuable were villager guided "tours" of Thakuri Gaun, other neighbourhoods, and forest areas.

Interviewing always involved probing and the use of non-leading helper questions. Probing simply means delving deeply into important or complex issues with informants. By following an informant's lead or logic, subjects were more easily comprehended (see Messerschmidt 1991). Messerschmidt (1991:19) discusses open-ended questions which he terms "non-leading 'helper questions'" - questions which ask why? what? when? where? who? and how? For me, these were almost always more productive than questions which solicited only yes and no answers.

Semi-structured interviews continually generated new ideas, new questions, and new hypotheses. It permitted me, in the midst of research, to make major changes in plans, to modify original design, and even to strike out in entirely new directions. For example, during my third month in the field I began to ask questions on the topic of bamboo utilization. My female informants told me that men knew the most about this topic. Until that moment, I had not considered researching men's knowledge in earnest. My focus changed, my problem evolved, and I spent the next month working with men.

As I discussed above, my investigation began with certain questions. I would obtain answers to these questions, and then use the answers to formulate new, more detailed questions. The answers to these lead to further questioning and cumulative learning on my part. During the semi-structured interview process, patterns began to emerge, and these patterns altered the focus of my research and my units of analysis.

When I realized that different groups of people - groups based on gender, caste, socio-economics, and age - know different things about the forest, I decided to not only find out what they know - the domains of knowledge - but why they know. In order to do this, I worked with key informants and groups of people with similar knowledge.

I conducted many interviews with "key informants" or local experts - people with special knowledge about areas of interest. These key informants would most often emerge from semi-structured and group interviews as people with a wealth of knowledge about a general topic, such as fodder species, or with specialized knowledge. For example I conducted a series of interviews with the Ward General Secretary and the forest watchman in order to obtain specific information on tenure, forest boundaries, and formal management rules. Sometimes, however, key informants would appear in other unexpected ways. Some presented themselves, hearing of my interest in forest-related topics. Others were brought to my attention by helpful villagers[10].

Perhaps the most fruitful type of interview for my research was the group interview. Group interviews proved to be an excellent way to approach sensitive issues (see Messerschmidt 1991). I would often simply bring up an issue or topic, and allow the villagers to proceed. As the villagers directed their own discussion, the aspects of the topic that were important to them would surface. Because I am not a social forester, it was often difficult to formulate questions about forest utilization practices. Informant directed interviews provided me with forest knowledge upon which I could base further questions and interviews. If a subject that I wished to know more about was not discussed by the group, I would pursue it at a later time in a more structured interview.

Villagers who participated in group interviews were selected purposively using criteria such as caste and gender. The criteria used emerged from semi-structured interviews and direct conversation as the variables which seemed most to influence the type and amount of indigenous forest knowledge that an individual possesses. Group interviews with one gender or caste group revealed common knowledge of specific topics, and provided information on both socio-economics and forest utilization which helped to explain these patterns in knowledge.

Informally, and throughout my entire time in the village, I obtained other types of information about Lahchowk and the status of the forests surrounding Lahchowk. Villagers who were not formally part of an interview or group discussion often joined in anyway. Friends, students in the morning English classes held on my front porch, my landlady, and the area health worker all contributed important information and insights.

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[10] One day, a man showed up on my doorstep with a pouchful of medicinal herbs. He was one of the local curers and had heard that I was interested in herbal remedies. In another case, a young village friend came across a women in the forest who had an extensive knowledge of forest herbs and foods. He immediately set up an interview and ran several miles back to my house to tell me, breathlessly, of his discovery.

During my interviews with caste groups of men and women I found that the visual sharing of a diagram or units (sticks or seeds) used for quantification, ranking or scoring, enabled villagers to discuss, manipulate, and alter physical representations or objects. The same is true of sketch maps (see Figure 3), which were an effective way of eliciting local knowledge about resources and tenure circumstances. By using local materials, the information is visible, added to, owned and verified by the participants.

Other visual activities, such as the construction of seasonal calendars using sticks and beans, and species identification exercises conducted with leaves, berries, roots, bark, and blossoms, were enthusiastically participated in by the villagers and, hence, produced valuable data. These activities were also very useful in cross-checking or triangulating on data that had been collected by other methods, such as participant observation and interviews. Interviews of this type also allowed villagers to agree upon, and make visual, generalized patterns of group resource knowledge and use. The patterns that I was observing were patterns that were recognized by local people.

I will conclude this section with a discussion of two groups of methods that I used toward the end of my time in Thakuri Gaun: 1.) life histories, trend analysis and time lines, and 2.) ranking, scoring and categorization activities. Life histories provided a historical perspective of how life in the community has changed, especially in relation to forest access, the quantity and quality of species available, changing perceptions and attitudes regarding forest resources, altered lopping and extraction patterns, and shifts in

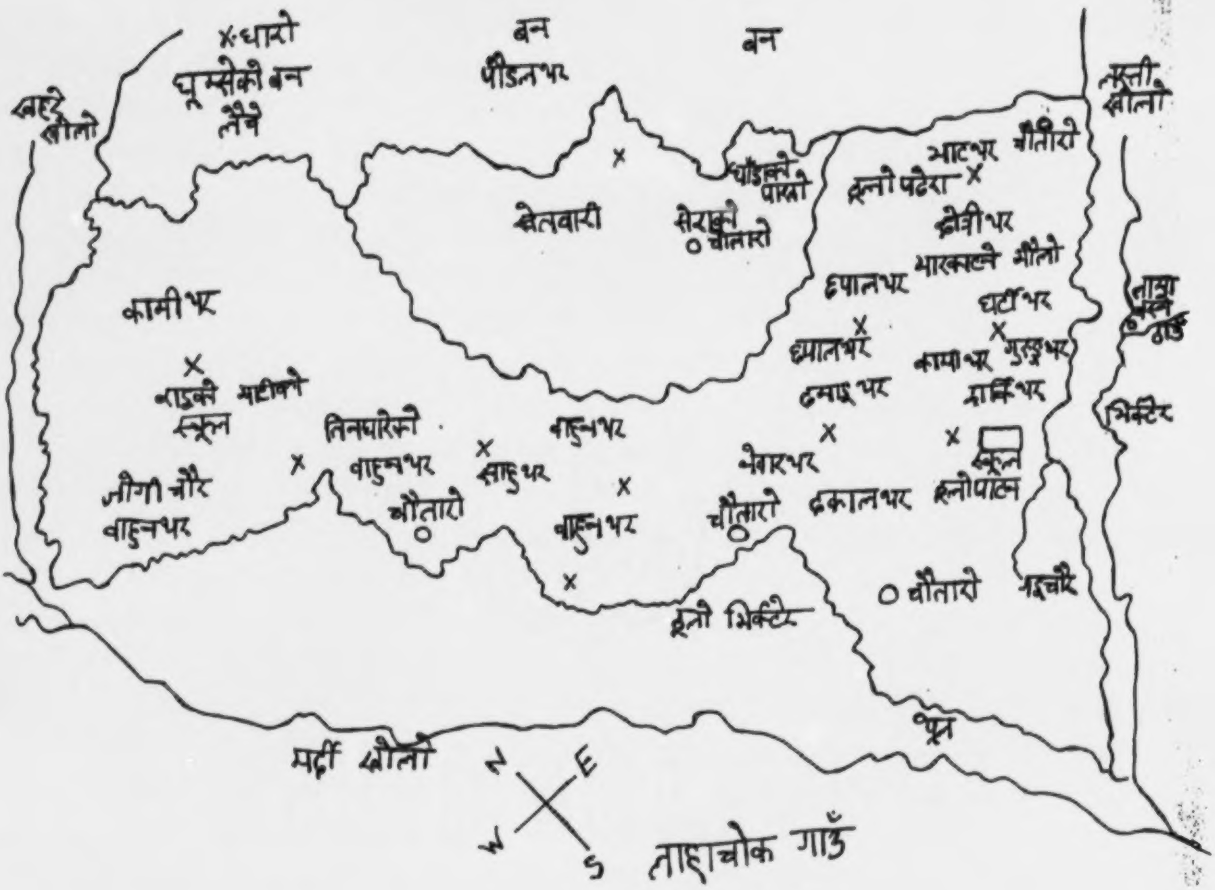
X·धारो
खहरे खोलो
घूम्सेको बन
लैंचे
बन
पीडनभर
बन
नस्ती खोलो
खेतबारी
घोडाको पासो
सेराको चौतारो
आलभर
चौतारो
ठूलो पधेरा
क्षेत्रीभर
भारदारले चौतो
ढपालभर
घर्तीभर
कामीभर
ध्यातभर
कामीभर
गुरुङभर
दमाइभर
सार्कीभर
नाग्रा ठाउँ
भिक्टिर
बाडुको मटीको स्कूल
तिनघरेको बाहुनभर
साहुभर
बाहुनभर
नेवारभर
स्कूल
जीगी चौर
बाहुनभर
चौतारो
बाहुनभर
चौतारो
ढकालभर
ठूलोपाटन
चौतारो
गहचौर
ठूलो भिक्टिर
पुल
मर्दी खोलो
N
E
W
S
लाहाचोक गाउँ

FIGURE 3 - MAP OF LAHCHOWK VILLAGE

This map of Lahchowk village was drawn by a young Sarki man from Thakuri Gaun. The map is astonishingly detailed. He first drew it in the dirt using a stick, and then copied it onto a piece of paper. The small round "o" marks represent the locations of religious trees, under which people gather to talk; the small "x" marks represent the location of village water taps. The accuracy of the map was confirmed by numerous other villagers and by my own investigations.

division of labour. All of this information, collected from older villagers, served to highlight trends in people-environment interactions. Villagers also constructed time lines by drawing on the ground with sticks, depicting events in chronological order, and discussing the impact of events on the community.

Ranking and scoring activities were particularly fruitful in providing information on preferred species of fodder and fuelwood. Preferences were ranked according to categories provided by the villagers, and descriptions of the properties of species, their location, and seasonality were also recorded.

Ethnoscience, which records indigenous knowledge and decision-making systems, can facilitate communication by providing a better understanding of how people perceive their environment and organize their perceptions (Warren and Cashman 1988). One of the methods I used for eliciting local categories was the construction of contrast sets and patterns. By asking questions such as, "Are there any other plants which you gather to make medicine?", I discovered informant "contrast sets" and subject attributes.

Attributes of things are used to sort out differences in categories. Contrast sets told me (from the informant's perspective) what is sought and what is avoided, what is needed and what is not, what is considered valuable and what is considered worthless (see Messerschmidt 1991). The general aim is to overcome the tendency to impose an outsider's structure upon a local situation by explaining why things are being done from the perspective of the local people.

All of the methods discussed here elicit people's own criteria and judgements and enable villagers to participate more in the investigation, mapping, diagramming, ranking, scoring, and analysis of their own knowledge and information. In addition, having a wide range of data gathering strategies allowed me to approach any subject or piece of information in several different ways. The flexibility inherent in this "multi-method" approach simultaneously changed my problem focus, and allowed me to deal with these changes.

The specific methods I used in the field were oriented towards enabling villagers' capabilities to be expressed, and giving them a feeling of confidence and self-worth in working with outsiders. It is important to note that the research did not just happen to the villagers, it happened with them. The research was supported by the village leaders and others influential in the community and this helped to develop rapport and greatly facilitated the research process.

Building good rapport is one of the most difficult and most important tasks of the anthropological field worker. It was a necessary precondition to the application of the above methodology. I developed three main methods of establishing rapport with my field population:

1. I approached the research from the humble perspective of a learner. All researchers, despite numerous degrees, field experiences, and publications are novices when it comes to the culture of the people in a new field setting. Villagers treated me, at first, as a child learning language, appropriate behaviour, and cultural meanings. This was not only useful because everything was explained to me in minute detail, it allowed me to be forgiven for mistakes and **faux pas** that Nepali adults would not have been.

2. I tried to treat all members of the community impartially and with respect. This was particularly difficult to achieve in a community that has institutionalized prejudice in the form of the Hindu caste system. However, as I was an outsider with different beliefs it was accepted early on that I would interact with all categories of villagers on the same level. With the Brahmin, I was treated as an honourary Brahmin, and the occupational castes interacted with me as if I were another occupational caste person. In this way my

status was "suspended" and I was able to act upon my own beliefs of equality and impartiality without jeopardizing my research[11].

3. I attempted to help the community as much as possible within my capacity. For example, I taught the village children English every morning, took the concerns of the occupational castes to the forest committee (**samiti**), and employed local research assistants. Teaching English to the children was extremely fruitful not just in terms of rapport, but because while I taught the children English, they taught me Nepali.

Fluency in the local language influences all of the other methodologies discussed above. Use of native terminology, supplied by the villagers, is crucial in eliciting knowledge about the culture. Interviewing, interpreting, translating, taking folk taxonomies, and documenting patterns and beliefs about resource use and management required local language fluency. Given the considerable detail in which local people know their environments, the best expression of that knowledge is in their own terms (Messerschmidt 1991). Hudson concisely summarizes the utility of this method as "...a flexible method for allowing people to structure their images of reality in their own terms (within the assumptions of the method itself) rather than forcing people to reply in terms of concepts supplied by the researcher" (as quoted in Rusten 1989)[12].

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[11] Under Hindu religious law, menstruating women are not allowed to eat in the same room as men, for fear of "pollution." Several times I mentioned to Brahmin women that I was unable to join them for the evening meal because I would pollute household males in this way. Upon discussing this with their husbands, the women always returned to tell me that, because I was a foreigner, I was not subject to the same restrictions and could, therefore, join them for dinner. Another example serves to illustrate my "suspended status" within the village. Occupational caste members would often come to my house with gifts of vegetables and other food. A young Brahmin girl observed this one day and inquired if they were not polluting me with their gifts (no person of a higher caste should accept food from a person of a lower caste). The occupational caste woman replied, "She is not a Hindu, how can she be polluted?"

I explained to the villagers early on in my field work that I was not a **thulo manche** ("big man"), but only a student. Therefore, I could not (as some villagers initially expected) get them money from the government or take their grievances to the King. I was concerned at first that my inability to really help the people would affect the amount and quality of information I could collect. But this was not to be the case. I feel that the villagers were less intimidated by me because they viewed me as a student, someone just learning about them and their community, rather than an "official person."

While the first chapter described the field context, this second chapter has looked at the problem context: the literature and theory that helped to formulate my problem, the arrival at units of analysis which enabled me to investigate the problem, and the methods I used to do so. In the first section I discussed the historical and current role of anthropology in development, and presented an argument which suggests that social forestry is akin to "anthropological forestry." This highlighted the crucial role that both anthropologists can, and must, play in natural resource development and suggested that understanding the dynamics of indigenous management systems and traditional forestry practices of the villagers of Nepal is an area of research that can potentially benefit natural resource development efforts (Rusten 1989). Related to this is the need for anthropological investigations which explore human ecological relationships that exist between tree resources and Nepalese farming systems, and to study important socio-cultural and economic variables that may influence forest management and forest resource utilization practices.

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[12] An example which illustrates the necessity of communicating in the language of the local people is my initial use of the term **aushradee**, which translates in Nepali as "medicine". I used this term when trying to obtain information about medicinal plants collected in the forest. Questions using this term, however, were met with confusion and negative answers. Finally, one of the villagers smiled, and, understanding what I was trying to get at, suggested that the colloquial term **joreebuthi**, which is more akin to "herbal remedy," was the correct word to use. Much data was collected on medicinal forest plants after this.

Next, I presented a brief critique of the three most prevalent theoretical approaches applied to natural resource management systems and strategies in Nepal, and discussed the approach which most shaped my thinking. Lastly, I described the methods which were most useful for my investigation and discussed the types of data which were generated from these methods.

Throughout my fieldwork, I attempted to understand what was happening in Thakuri Gaun in terms of larger the Nepalese culture, and in terms of forest history and the current status of forestry in Nepal. In order to provide a context within which to place forestry in Lahchowk, I reviewed literature on the history and present status of Nepal's forests and worked with social foresters at the Institute of Forestry in Pokhara. Because many of the problems and conflicts discussed later in the thesis require some knowledge of the background to the larger forestry problem within Nepal, I will discuss these issues in the following chapter.

CHAPTER III
FORESTRY IN NEPAL

This thesis concerns both land use, and land use rights. It is important to state at the outset that while rights to use the forest and actual forest use are related concepts, they are not synonymous. The history of government control over forests involves numerous policy and legislation changes, but the actual utilization of forest resources by Nepali farmers has remained fairly constant, despite policy which either encouraged or discouraged access to the forest.

This chapter deals with this fundamental division through a discussion of both management and use. I first present a general historical overview of forest use rights in Nepal from pre-history to the present. The next section deals with forest use and management today, with illustrations from both the national policy level and the local management level. I then present two interrelated sections: "The 'forest problem'?" and "People first or forest first: paradigm problems". These sections discuss the "forest problem" in terms of both use/management conflicts and national/local conflicts, and social forestry development. Lastly, I introduce and define the concept of indigenous knowledge. Indigenous knowledge is then discussed in terms its problematic and potential uses in resource management.

1. The history of forest use rights

Hundreds of years before the extension of centralized political control beyond the Kathmandu Valley, many Nepali communities had developed systems to manage their natural resources. These systems defined specific users' rights to valuable products from trees growing on common lands, and limited the cutting of certain species. Local people enjoyed almost total autonomy in using and managing these forests. Government interference, beginning with the Shah rulers, initiated a cycle which threatened and often disrupted these long-established local systems.

The early Shah rulers of Nepal (beginning in the 17th century) were interested in territorial expansion, so they used forests to pay for their army officers and other employees through handing out land grants (Army Area Handbook 1964). Grants were made by the rulers on the basis of official civil or military service. All of the produce from the land belonged to the holders of the grants, but their rights expired when they discontinued their service to the state or their lands were recalled or confiscated (Mahat et al. 1986). During this era, government enforcement of policies for protecting forests were both sporadic and confined to religious locations or other public places. The Shah rulers had already developed commercial interests in the terai forests, but paid little attention to the value of the hill forests (Acharya 1990).

The sporadic implementation of these policies continued throughout the Rana period, which spanned just over a century, 1846-1950. Like their predecessors, the Rana rulers issued circulars and orders to protect certain hill forests in vulnerable locations. However, during the later part of the Rana regime, state interests in forests increased considerably both for commercial and diplomatic reasons. Generally, the Rana rulers encouraged clear-cutting for cultivation purposes. In addition, they exported large amounts of timber from the terai to India and allowed merchants to undertake timber businesses after paying fees to the government. Finally, the Ranas granted forests to their relatives, attendants and employees as gifts or in lieu of salary (Mahat et al. 1986).

After the Ranas were displaced from power in 1950, a series of new governments working under King Tribhuvan conceived of forests as national property and tried to extend state control over the forests which the Rana rulers had granted to their favourites. The newly established governments run by political party leaders believed that the problem of deforestation in Nepal was primarily a result of the Rana rulers' policy of granting forests to their employees, relatives, and attendants. Thus the government initiated legislative actions to expand state control over all forests granted to private individuals by the Rana rulers (Acharya 1990).

According to the Private Forests Nationalization Act of 1957 all private forests exceeding 1.3 hectares were nationalized. All forests and uncultivated land in Nepal became property of the state (Speth 1990). The premise behind the Act of 1957 was that nationalizing private forests would keep these national resources from destruction and conserve, manage and utilize the forest for the benefit of the people and the country (Acharya 1990).

As the newly introduced political system necessitated the formation of village panchayats[13], the Forestry Act of 1961 made provision for Panchayat Forests that consisted of parts of the state forest which were allocated to village panchayats for protection and use. People were required to obtain forest products only from the Panchayat Forests. The panchayat had to issue formal permits for people to collect forest products for household consumption and prohibited many acts in Panchayat Forests. Government Forests included all forests other than private and Panchayat Forests; the law prohibited people from collecting any products from Government Forests (Acharya 1990).

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[13] Panchayats are often described as village councils, and are based on traditional South Asian Hindu bodies of caste or village elders endowed with various jural powers. The panchayat system in Nepal was a multi-tiered series of representative bodies, at the apex of which was the National Panchayat (analogous to a national parliament), which met in Kathmandu. Each panchayat body was elected from the one immediately below it, and at the bottom of the pyramid was the village panchayat. the village panchayat consisted of representatives of a cluster of several villages, representing approximately two thousand people on average. This local body contained eleven members: nine representatives, a chairman (**pradhan**) and an assistant **pradhan** (Fisher 1986, Saul 1990).

Far from benefitting the local people, however, the new intensive forest management policy served to undermine local needs, capacities, and rights. By taking forest control out of the hands of local community leaders, and placing it firmly in the hands of the Ministry of Forests, the government lost all hope of enforcing the law effectively and managing the forest equitably. Corruption became widespread within the Ministry of Forests. Forests became new sources of private profit for government employees, politicians, and local elites (Acharya 1990; Balla et al. 1991).

At the same time, land survey legislation was introduced which defined land adjacent to forest which was left fallow for at least two years as forest land. In some cases, forests which were thus no longer under communal jurisdiction rapidly deteriorated and the government was unable to establish any real level of formal control (FAO 1985).

Responding to wide-spread criticism and realizing that local people had to be involved in forest management, the government passed new and far-sighted Community Forestry legislation. Under the Panchayat Forestry Acts of 1978 and 1980, a portion of the national forests was set aside for participatory management. These amendments made provisions for several categories of forests that private individuals, religious institutions, and village panchayats could legally own, utilize, and manage - at least partially and according to the government's terms and conditions. The government subsidized local people to plant trees on their private holdings or provided state land for reforestation on a contract to individuals or institutions. In addition, these laws allowed for degraded lands and existing forest to be turned over to village panchayats (Metz 1991, Acharya 1990). This new legislation categorized forests into three types:

1. Panchayat Forest (PF): a maximum area of 125 hectares of bare and degraded "wastelands" upon which a plantation could be developed. The management, ownership, and protection were vested in the village panchayat. The areas were planted and protected at the request and with the participation of the local panchayat. Although the panchayat had all rights to the produce of this forest, many villagers felt that these forests were not, indeed, their own. These feelings were based on historical precedent and the failure of government officials to explain new policies to local people.

2. Panchayat Protected Forest (PPF): a maximum of 500 hectares of natural forest, which usually needed upgrading through planting, as well as subsequent protection and management. Panchayats which undertook these activities were allowed to keep 75% of the revenue generated by the forests, although the usual return to the panchayat was no more than 40% (FAO 1985, Speth 1990).

3. Leasehold Forest (contract forest): treeless government land leased to individuals and/or organizations for the production of timber, fuel, and fodder with a nominal annual yearly rent.

A comparison of the land actually handed over in this way with the land potentially available for transfer is instructive. Although legislation provided for 1,835,000 hectares to be handed over to local control, only 36,376 hectares was transferred. Of the area handed over, management plans had been prepared for only 5,977 hectares. Only 10% of the plans approved allowed for significant utilization. Thus operative control and use of forests was effectively allowed in only a few hundred hectares in less than half of the districts in Nepal (Messerschmidt 1991).

These legislative changes certainly had advantages, but they were not free from limitations. The major advantage was that the government supported local people in establishing plantations. But not even the District Forest Offices knew how and with what arrangements local people could be authorized to control and manage forest resources (Acharya 1990). The official distinction between PF or PPF was based on national needs and goals and did not necessarily reflect local perceptions of forest tenure conditions. This lead to confusion between traditional rules and rights, and the new panchayat laws.

Two other factors that partly limited the functioning of the new, strict regulations were that 1.) villagers in the hills needed the forest for their subsistence, and 2.) local villagers were unaware of these regulations due to the distance and lack of communication between hill areas and administrative centres. "Essential to administration for forest resources is understanding the rules and regulations governing community forestry. Few people in villages, male or female, seem to have a good grasp of the legislation. Some estimate that as few as twenty percent of villagers understand it" (Inserra 1988:10).

This highlights the critical distinction between **de facto** and **de jure** ownership and use rights, which very much depends on people's perception. People often consider areas to belong to them, rather than being the legal property of the state, since they traditionally have collected their forest products from these places (Gilmour 1987, Arnold and Campbell 1986).

In the late 1980s Panchayat Forest regulations concerning forest reserve size and revenue percentages were again amended to become more beneficial for the panchayat (Speth 1990). This direction was reinforced by the "Master Plan for the Forestry Sector" (1988) and the associated, "Operational Guidelines for the Implementation of the Community Forestry Programme, Nepal". The local community was specifically defined as the "user group" of a particular forest (Fisher 1991). They now prepared the operational plan for their forest. This, for example, may cover what species and areas are to be planted, who can use the forest, how forest products will be distributed, how the forest will be protected, and the manner of future decision-making (Fisher 1991).

2. Forest use and management today

Prior to 1990, the legislation provided for the management of forests by village users. The Panchayat System of government in Nepal, under which the PFs and PPFs were administered, was abolished after the revolution in April 1990. There are now three types of forest land tenure: government reserve, commons (community and communal forests), and private holdings (private trees and woodlots). The main source of fuelwood is government forest. By law, all non-private forest holdings are considered government land in Nepal. Exploitation of government resources for cutting either fuelwood or timber is regulated by law. The law states that all cutting is banned except by official permit issued by the District Forest Office. But the collection of twigs and fallen branches for fuel, of leaves and some other minor forest products for household use is allowed without permit (Balla et al. 1991). In practice, villagers make extensive use of government forests and considerable illegal cutting is common in the hills of Kaski District (as it is throughout Nepal).

The second most widely exploited source of fuelwood is local community forests. The regular "community forest" (**samudiyak ban**) follows a model that is being promoted by the government in all areas of Nepal (Balla et al. 1991). These systems are managed by a forest committee, made up of representatives of local users from a neighbourhood or ward or the entire community, regardless of caste or ethnic identity.

Another form noted in Kaski district (and the main type of forest management system in Lahchowk village) is the communal or caste-based forest. This implies the exclusion of some groups within the community through restrictive rules of management, access and utilization (Messerschmidt 1990). In these systems, villagers typically hire a forest guard or watcher (**heralu**) to protect the forest from intruders and to assure that legitimate users follow the rules established by the forest committee.

Not surprisingly, researchers have found that a large percentage of Nepal's communities have established some type of indigenous management system in their forests (Campbell and Bhattarai 1982; Campbell et al 1987; Messerschmidt 1986, 1991; Fisher 1988; Fisher and Malla 1987; Metz 1990). Contrary to the general belief held by the forestry profession in Nepal that villagers, if unsupervised, will destroy the forest, "...it is the collective realization, decision, support and commitment of the village community to protect forests which leads to the existence of protection practices" (Speth 1990:10).

Protection of forests by local communities does not mean absolute closure of forests. In a majority of cases the term reflects the fact that some control exists over their use. In some villages in Kaski District forests are protected from neighbouring villages on the basis of an informal agreement of exchange; several neighbouring villages come to an agreement to allow their residents to cut grass, collect dry fallen wood, and graze livestock for limited periods. They also agree not to cut green firewood, timber, poles, and tree fodder from each others' forest (Balla et al. 1990, Speth 1990, Messerschmidt 1990). Other villages in Kaski District do not specify areas of forest from which products may be harvested. Any area within the forest may be harvested, the only restriction being that outsiders are excluded. Still other villages divide their forest into blocks. Products from different blocks are harvested annually in rotation.

The general objective in managing forests is to obtain sufficient forest products for survival. However objectives sometimes vary, and with them forest management practices. Examples of different objectives are regeneration of forests and trees, achievement of biological goals through selective harvest of various species and products, or the fulfilling of religious obligations and gaining of religious merit. In many villages in Kaski District villagers have initiated forest management practices in public forests with the objective of stopping the depletion of forest resources and of increasing the availability of forest products (Speth 1990).

Balla et al. (1991) state that the contemporary techniques for managing community forests are neither traditional ones nor government sponsored initiatives. They are recent local innovations that have emerged in response to the government's emphasis upon community forests. As will be shown, in Thakuri Gaun the evolution of management systems does not support Balla et al. in their thesis.

3. The "forest problem"?

There have been major problems in implementing community forestry in Nepal. Within the Ministry of Forests, policy concerning community forestry does not match action in the field. The move towards democracy has made community forestry "politically correct," and government policy reflects this. But there has been no move to enforce these new and enlightened policy statements. Therefore, foresters and the forestry profession continue to operate within a paradigm which is inappropriate for community forestry.

The old forestry paradigm, which sees forestry development as being concerned with protecting the trees from the people, with the forestry officials being the repositories of all knowledge, remains dominant (Messerschmidt 1991). Forestry operates within a paradigm influenced by Western economic philosophy and scientific thought, bounded by the concept of the "forestry problem" in Nepal. This problem, as described so graphically by Eckholm (1975a, 1984), is the problem of shrinking and degraded forests. In this old paradigm, the obvious culprits are the hill farmers who are not just ignorant of proper forest use and management, but are aggressively destroying the forests out of greedy and selfish motivations. It follows that they must be convinced, and even policed, to protect the forest.

Gilmour and Fisher (1991) write that the culture of professional foresters includes assumptions about the priority of technical knowledge about trees in all forestry activities. Such assumptions lead to a tendency to ignore the relevance of local knowledge and place villagers either outside or on the periphery of the forest. Such assumptions implicate local people as the cause of the "forestry problem", rather than potential participants in the "forestry solution".

There are signs, however, that a much needed paradigm shift may be occurring within the forestry profession among foresters working in Nepal. Foresters are beginning to shift their views away from people as the cause of the "forestry problem". This is somewhat akin to what Kuhn describes as a "conversion experience" which leads the scientist to re-interpret previously "known" phenomena (Foster-Carter 1976:169-170).

The new community forestry paradigm starts from a different "world view" which has lead to new perceptions of a number of forestry related problems in Nepal (Gilmour 1988, 1990; Carter and Gilmour 1989). Community forestry is not just a different sort of activity. It involves an entirely different sort of professional culture, with differing assumptions about the intellectual scope of forestry, the nature of multidisciplinary activities and the responsibilities and roles of foresters, villagers, and other disciplinary specialists (Messerschmidt 1991).

Community forestry today has come to realize that the management of people managing resources - the management of resource needs - is perhaps an even more important management goal than actively managing the natural environment. People can manage natural resources in part, even in large part, by manipulating the type and amount of their resource use (Thompson and Warburton 1985a, 1985b; Lewis 1982; Messerschmidt 1987).

4. People first or forest first? Paradigm problems

Forestry in Nepal has been slow to accept the new paradigm. As Gilmour and Fisher point out,

> ...[T]he change in public position has not yet been accompanied by a paradigm shift. So far, the stated position in community forestry has largely been accompanied by a conceptual framework derived from 'traditional' industrial forestry. This old framework tends to separate social and biophysical elements, if not actually ignoring the social (1991:17).

In short, concludes Messerschmidt, despite all the good-sounding rhetoric, "people first" may not really be the end that is sought, but only a new means to achieving the same old objective of "forest first" (Messerschmidt 1990:6).

Messerschmidt (1991) goes on to say that the new paradigm of community forestry has largely failed, but perhaps it has not even been tested. Despite the lip service that has been paid to the community and the user group, very little real involvement with the people who use the forest has taken place. He gives the example of the type of social science typically involved in projects. This involvement has been largely concerned with providing the information that foresters, as primary project implementers, regard as necessary. The result has been the predominance of a very static view of the human component in community forestry. Foresters have been provided with quantified data on whether people want trees, what type they want, how many hours they spend gathering forest products, how much firewood they use, etc. Much data is collected on household composition, livestock number and landholding size without any thought of what it might be used for. Some of this information may, indeed, be useful. Much of it is not.

But it is what is missing that is most important. There is little sense of the dynamics of the social structures and social processes that are the context within which community forestry occurs. The fact that community forestry is a social process, concerned with the management of forest resources by complex and changing social institutions and organizations, is forgotten (Messerschmidt 1991, Gilmour and Fisher 1991). Community forestry occurs within the context of a cultural system. Forest knowledge and resource management are cultural, as well as ecological, processes. It is the recognition of this fact that holds the key to success in resource management efforts.

Perhaps the central conflict between the two paradigms - "people first" and "forest first" - and a major contributing factor to the "forest problem" is that of whose knowledge should have primacy. Local management and use make operational local systems of indigenous knowledge. Government or extra-community control over forests make operational a non-traditional, non-local, "scientific forestry" system of knowledge. The "forest problem" in Nepal and the "forest problem" in Thakuri Gaun both concern conflict between systems - indigenous and externally imposed systems.

5. Indigenous Knowledge

As we have seen, under the old definition of the "forest problem" it was "...assumed that unschooled rural people know nothing of technical matters" (Tamang 1990:iii), that local forest users are already destroying Nepal's forests, and that it would be madness to give local users the authority to manage the forests (Metz 1991). Social scientists and the new social foresters are challenging these myths. A recognition of the depth and complexity of indigenous forest knowledge possessed by local people is an important starting point for recognizing the roles rural people can play in forestry development.

a. Indigenous knowledge defined

Through experience and experimentation rural dwellers have developed detailed and sophisticated knowledge about natural resources, including forests and trees. The term "indigenous technical knowledge system" has been used to describe this vast body of information, plus the skills, technology, and practices used to manage the environment (Castro 1990). One of the most condensed but comprehensive definitions of indigenous technical knowledge (ITK) is given by Warren and Cashman. They define ITK as "the sum of experience and knowledge of a given ethnic group that forms the basis for decision-making in the face of familiar and unfamiliar problems and challenges" (1988:3).

Indigenous technical knowledge is also sometimes called "local knowledge" (Wiersum 1988), "traditional ecological knowledge" (Woodley 1991), and "folk knowledge" (Messerschmidt 1991). Many researchers stress the difference between the terms "traditional" and "indigenous", and indeed a clear distinction should be made. Following Fisher (1989) and Fisher et al. (1989), the term "traditional" will not be used in this thesis to describe local knowledge systems. There are two reasons for this.

Firstly, some of the features of the local systems identified are of quite recent origin. While they incorporate some of the characteristics and practices of forest management in the past and often reflect traditional use-rights, they are often quite new responses to a changing situation, rather than mere remnants of an earlier system. Indigenous knowledge is fluid, adapts to changing social and natural environments, and often spans a range of vintages.

ITK systems of resource management do not function in isolation from internal and external social, economic, and political forces. They must react to changes such as the degradation and loss of forest area, increased local population, reduced access to resources by certain segments of the population, increased access to formal education, outmigration of men, increased cash-economy, etc.

Secondly, the term traditional does not necessarily indicate whether a system is a local initiative or one imposed by outside agencies. Systems may indeed be traditional (very old) without being indigenous. The word "indigenous," as Gilmour and Fisher (1991) use it - and as it is used here - implies local initiative, something not "sponsored" by outside agencies. But we must be cautious when we use the term "indigenous" not to imply that the content of such knowledge systems originates solely from within the indigenous society in question. The bodies of knowledge of most, if not all, societies consist of a mix of knowledge, indigenous and exogenous in origin. The stock of technical knowledge which is indigenous to any social group is likely to be a mixture of knowledge created indigenously and knowledge acquired from outside and absorbed and integrated within the group (Bell 1979, Brokensha et al. 1980).

To be indigenous, technical knowledge must not merely be present within the socio-economic and spatial boundaries, but also an active component of the culture of the social group concerned, being stored, communicated, and used by its members to serve some purpose in relation to productive activity within the society. Indigenous knowledge, therefore, is not a static body of wisdom, but instead consists of dynamic insights and techniques which are changed over time through experimentation and adaptations to environment and socio-economic change (Thrupp 1988).

This is an important point. Because ITK is often based on scientific methods and forms of analysis, such as experimentation, trial and error, observation and adaptation, it should not be called "non-scientific" knowledge. Some indigenous knowledge is merely passed down through the generations and is not tested; this knowledge is part of a practical technology, and not necessarily scientific. But other knowledge is discovered or rediscovered through scientific processes of observing, sampling, testing hypotheses, and making informed predictions. These perceptions of regularity and order, cause and effect, develop into formal knowledge systems which are shared by all, or certain, members of the commmunity.

Indigenous means "of the people"; technical knowledge refers to what is known about a particular subject, art, or craft. Indigenous knowledge is defined in abstract and literal terms as the sum of science, technology, environmental understanding, information sharing, and social understanding (i.e., knowledge) possessed and used by a specific social unit in a defined locality (i.e., indigenous). It therefore forms a large part of the culture of rural people (Joshi 1984, Messerschmidt 1991).

One can record indigenous knowledge with little or no reference to culture apart from at the most basic, descriptive level. But a description of "what" people know is not anthropology. Anthropology seeks to understand both cultural patterns and deviations from these established patterns. Only by placing indigenous knowledge data within the larger context of the culture can one hope to understand not just "what" people know, but "why" they know it.

Differences and commonalities in type and amount of knowledge can only be explained with reference to the larger culture. What is the cultural relationship between age and knowledge? How are gender roles played out and what do individuals need to know in order to play these roles? Do social divisions reflect or coincide with divisions between domains of knowledge? A much deeper and broader understanding of local knowledge is gained by placing this knowledge within the larger context of local culture.

This appreciation for what anthropology terms "holism" has been slow to penetrate development theory. Disciplinary specialization most often precludes holism: engineers design dams; agriculturalists introduce improved varieties of rice; and anthropologists record obscure and dying cultures. These rigid "job descriptions" are increasingly being challenged by the recognition of the vital link between what anthropologists traditionally study - culture - and what developers are coming to appreciate as the key to real development - indigenous knowledge.

b. Indigenous knowledge and forestry development

Using ITK in development goes back to the early works of anthropologists and geographers. More recently, however, ecologists concerned about environmental deterioration and the issue of maintaining the environmental balance have expressed renewed interest in traditional technologies and indigenous knowledge (Bartlett 1980). With the emergence of increasing anthropological and agroecological studies from the Third World, growing numbers of analysts and development practitioners have expressed positive or laudatory views of local knowledge and capacities. They usually characterize culture-based knowledge and practices as effective, efficient, and functional (Thrupp 1988).

Unfortunately, despite the new appreciation of the critical role that indigenous people and their knowledge can play in development and environmental management, many foresters and researchers still lay stock in the ability of government and outside technology to reverse environmental degradation, and "increase productivity". Metz (1991) outlines three responses to this prevalent, but outmoded, line of thinking.

First, forest degradation has a long history and government policies have contributed greatly to it. Second, farmers need forest products and so will want to improve their availability; farmers have detailed knowledge about forests and are already managing forests. Third, past government attempts to manage and regulate forests have failed because they have ignored forest users, because they have forbidden forest users to cut the forest material they need to survive, and because these laws undermine local control and increase the difficulty of establishing indigenous forest management.

The reality is that through practical experience rural people have learned a great deal about their local environments, and over the years have developed tree management practices that - given the various trade-offs and constraints they face - can and do achieve sustainable use of trees and other forest resources. Bista (1991) writes that, because the village is a relatively discrete unit with a known geographic boundary, there is an intimacy between the people of the village and the land they live on and cultivate. This intimacy is based on the people's dependence on the land for nurture which requires that they be particularly sensitive to its perturbations and the methods by which it might be revitalized. To ensure their continued nurturance in this manner, the people have over a long period of time developed particular practical technologies, the application of which helps to ensure the productivity of the forest.

"[F]orestry" writes Messerschmidt, "is practiced by almost everyone in the hills. Every forest user is a forest manager and, therefore, a silvicultural practitioner" (1991:81). Fisher writes that

> Nepali farmers are also foresters. Not in the conventional sense that they have formal training in forestry but due to the fact that they make extensive use of forest and tree products to supply many of their daily necessities. They have, therefore, a considerable knowledge about growing and tending trees as well as managing forests to meet their needs (1991:32).

Indigenous forest management embraces a complex and difficult set of tasks; local villagers who manage forests are highly experienced, skilled and knowledgeable. Despite the prevalence of local forest use and management, and the richness of local knowledge, traditional foresters and Western "experts" remain, largely, unconvinced. They continue to ask, "Why do we need to study indigenous knowledge; what purpose will it serve?"

Upadhyay responds, arguing that "...indigenous knowledge, together with its dynamics and potential should be explored to help natural resource development. The success of any rural development programme lies in understanding the indigenous knowledge and resource management systems within its farming communitities" (1991:3). Research and development experiences have shown that the traditional knowledge and resource management practices of rural communities can be an effective basis for conservation and development. "In forestry as in agriculture, in Nepal as elsewhere in the developing world, experience demonstrates that the prospects of success of innovations brought in from outside will be enhanced if they build upon indigenous knowledge" (Metz 1991:iv).

My own and Tamang's (1990) literature reviews revealed that documented knowledge about indigenous forest management in Nepal is scant. In fact, as of 1990 there were only four studies focusing on indigenous forest management. Tamang calls for more studies in Nepal that document indigenous knowledge systems (including classification/ categorization and evaluation) about silvicultural practices of resource management; the advantages and disadvantages of existing forest management practices; and the social, economic and political variables that influence forest/tree management. Lastly, she points out the need for further description and analysis of indigenous forest management practices; equity related to distribution of forest products and benefits; political, social, and ethnographic history of forest and people who live in and around them; and the conditions (biophysical and cultural) under which indigenous forest management occurs.

We also need to learn much more about the organizational aspect of forest management and who makes decisions concerning forest resource protection, planting, distribution, and harvesting in user households, user groups, and village communities. With the exception of a handful of recent publications (see Subedi et al. 1991, Nepali 1991, and Rusten 1989), there is a dearth of published material on indigenous knowledge and indigenous management systems in the hills of Nepal. A few studies consist of descriptions of the organizational aspect of indigenous forest management, but in most instances the descriptions are anecdotal.

For Nepali foresters there are several aspects of these traditional knowledge systems that are relevant: knowledge of forestry practices, knowledge about the physical environment, biological classification or folk taxonomic systems, and the experimental nature of this knowledge (Altieri 1988). Barnett writes that "[E]xisting cultures constitute data banks of evolving adaptive solutions and maladaptive responses. The loss of real knowledge...means the loss of potentially adaptive mechanisms and reduces the probability of survival for all" (1988:24). It follows that we need to understand not only what local people do and want, but also why they use particular practices and species, and why they believe certain practices work or do not work - ie., the principles, knowledge systems, and epistemologies which underlie the physical results. But it is also important to recognize that indigenous knowledge has value in and of itself. People's own knowledge systems are legitimate for those cultures, independent of "proof" by scientific models and paradigms.

Integrating indigenous forest knowledge into both government legislation and development policy is critical for successful and sustainable resource management. "In order to enhance local management of forest resources we first need to see what social mechanisms and technical knowledge for doing so are already in place. We need then to recognize and support what is working and to facilitate local problem solving when things are not going so well" (Messerschmidt 1991:56). Numerous authors have called for amendment to existing legislation and policies, one of the needs being to recognize, integrate, and utilize local knowledge in external forest management programmes (Messerschmidt 1984; Molnar 1981; Rusten 1989; Fisher and Gilmour 1991; Mathias-Mundy et al. 1990; Chambers 1992).

Overall, the authors recommend 1.) improvement in the role of government and development agencies in supporting indigenous forest management initiatives; 2.) amendment of existing legislation and policies; and 3.) the recognition and utilization of the knowledge of local villagers. "If we want to make a contribution, we must begin with indigenous knowledge... Assistance is especially necessary when population growth and other factors have altered the conditions in which the IKS [Indigenous Knowledge System] was developed" (Roling and Engel 1988:6).

This chapter has dealt with the historic factors and present context of forest use and management in Nepal. The government of Nepal still wields much control over forest management and prohibits local people from collecting forest products. This lack of local control is encouraging, rather than ameliorating, conflicts over forest resources. Prohibitions on utilizing resources have created hardships for local people, giving rise to an array of diverse ways - some adaptive, some maladaptive - to obtain and manage the forest products they need.

The factors that influence the nature of local management are dynamic and subject to transformation under the influence of demographic changes (population growth, immigration, out migration), and institutional changes such as the 1957 nationalization of forests and the introduction of the PPF Acts (Wiersum 1989). My exploration of the ways in which individuals and groups within Thakuri Gaun manage and utilize their forest resources illustrates the interaction between external and internal processes, and illuminates the central role that indigenous knowledge plays in resource management. It is to this that I now turn.

CHAPTER IV

USE AND MANAGEMENT OF THAKURI FOREST

The dynamics between different groups of people, and between the forest and the villagers of Thakuri Gaun can be seen as a microcosmic representation of the "forestry problem" in Nepal. As I have outlined, the "forestry problem" has been redefined as a people problem, one which involves, but is not caused by, local villagers. My fieldwork in Lahchowk was an intimate exploration of this problem from the villagers' point of view. The testimony and practices of individuals summarized in the following chapters are not unique to Lahchowk; they are undoubtedly repeated throughout the whole of Nepal.

My research has lead me to believe that Nepal's "people problem" concerning the forest is the result of a complex interplay of decision-making and innovation by individuals. Individual choices, however, are not idiosyncratic or random. Fieldwork in Lahchowk reveals that they are part of a larger pattern of adaptation to population pressure and resource scarcity.

Viewed diachronically, local adaptation of the use and management strategies of villagers in Thakuri Gaun follows the pattern common throughout the mid-hills of Nepal. Village populations have grown; in many areas forest land has been cleared for agricultural use; the concomitant pressure on the forest has increased dramatically. In Thakuri Gaun this trend is obvious. Forest land is no longer sold to members outside of the officially recognized user group, and even the sons of owner users must sometimes apply to the forest committee to purchase shares. Caste conflict has increased as the forest area has become more degraded, and there are definite divisions between "in-group" and "out-group" in relation to the forest.

One of the most striking results of this resource pressure and the conflicts surrounding it is the growing separation between "real" and "ideal" management rules and practice. Previously, rules were both more flexible and more widely followed by villagers. There were fewer users and the forest was more plentiful: "There was a lot of forest when I was young," an old woman remembered, "we could cut whatever we wanted. The forest is still there but now it is too restricted. We can't get enough now that there is a forest watchman to stop us. I can't find enough firewood and must dig roots to burn." In this old woman's youth, trees of preferred species were plentiful and the lopping of green trees and branches was not frowned on because the forest was seen as an inexhaustible, renewable resource. Occupational caste villagers were not a threat and were allowed unlimited access to the forest.

Current "common" knowledge, however, encodes deviation from previous ideals or rules of forest use and management. The conflict between community use and communal management has grown, so that even owner user women violate management rules. Village women are not ignorant of proper and sound cutting techniques; they are denied the environment, both natural and cultural, in which to employ them. The forest is formally, and strictly managed by an elite group of high status men. Their policy is one of exclusion. But the need for forest resources includes the entire community. Occupational caste women have institutionalized the practice of deception of "managers" by "users" and this conflict involves the entire community. Occupational caste men are drawn into the conflict by female family members, and high caste women are also blamed by the forest committee for the destruction of the forest.

The picture is one of a web of conflicting interests and ideals, both external and internal. There is a definite gender conflict between the men who manage and the women who use the forest. There is a caste conflict between the occupational caste "access users" and the high caste "owner users". There is a conflict between District Forest Office policy, which upholds the previous forest rules, and the majority of users who deviate from these established rules. High caste women experience internal conflict: because of resource pressures they are unable to abide by the rules set out by their own forest committee.

This chapter explores the contrasts between the ideal decision-making process and resultant management policy for Thakuri forest, and the on-the-ground decision making and real practices that women employ to harvest forest resources. Seasonality and location of forest resource utilization are examined to reveal utilization patterns. I also explore the ramifications of illegal practices within the forest in terms of "owner users" and "access users", and ideal and real management and use. I then investigate the conflicts which stem from this juxtaposition surrounding forest resources, and conclude with a discussion of conservation practices and beliefs.

1. Use rights

When Lahchowk first began as a village some 200 years ago, the forefathers - a Ghale Gurung, a Gharti Chhetri, and a Thakuri - owned Thakuri Ban (**ban** is the Nepali word for forest). Through the generations, they handed down the forest to their sons and their sons' families, as well as selling forest plots to incoming families of the same caste or ethnic group. Because the Thakuri population has grown quickly, each Thakuri household now has user rights to only a small part of Thakuri Ban, whereas the Gurung and the Gharti Chhetri maintained their small numbers and therefore have relatively larger areas of Thakuri Ban for their use. Before 2035 BS (1978 AD), some Thakuri sold their forest plots to Adhikari Brahmin households when they needed money. Forest is no longer sold because the forest "has been reduced".

All of the Thakuri, Newar, Thapa Magar and Gurung households within Thakuri Gaun, along with a number of other households outside of Thakuri Gaun, are **bijan** holders in Thakuri Ban. Land that is used by the villagers, but is officially owned by the government and therefore cannot be officially registered is called **bijan**. **Bijan** is a Nepali term which means to obtain shares in forest land. Forest users refer to **bijan** land as "our own", not as belonging to the government. Those people who own officially registered land within the forest are called **sanat** holders, and they, too, are part of the officially recognized user group of a particular forest. **Sanat** holdings usually refer to private forests where a number of brothers or male relatives own a private forest area which they have registered as their own land with the District Forest Office.

I employ the term "owner user" as an umbrella term for **sanat** and **bijan** holders. Owner user describes any person who belongs to the formal, locally recognized, locally institutionalized group of users of a specific private or communal/caste forest. Owner users select people from within the "user group" to sit on the forest committee. For example, Thakuri, Gurung, Newar, Thapa Magar, and Gharti Chhetri are all owner users of forest plots within Thakuri Ban. The term "access user" is used to designate any person who uses the forest but is outside of the local institution of user groups. These users, although they often have access to the communal forest, have no formal rights and no representation on the forest committee (**samiti**). Access users of communal or caste based forests are the Sunar, Damai, and Sarki.

Official use rights to forest resources in Lahchowk are restricted not only on the basis of caste - no occupational caste villager, as far as I know, has use rights to any communal forest area around Lahchowk - but also on the basis of residence. Fisher (1989) found that use rights to forests in Nepal are usually based on residence - all people in a given location have use-rights. In Lahchowk village, where kinship and caste affiliation are involved, this seems usually to operate in combination with a residence requirement. Analysis of user group composition shows that politico-administrative boundaries (such as panchayat and ward boundaries) do not often coincide with user group membership. However, use rights usually depend on residential proximity to a forest (see Messerschmidt 1991); this ties in with hereditary use since villagers generally try to exploit the forests that are closest to their place of residence, and have been doing so for generations.

Residence outside of a certain ward or designated neighbourhood boundary does not preclude households from holding shares within a forest. For example, Ward #2 is adjacent to ward #4 (Thakuri Ban is the closest forest to both wards) and the Gharti Chhetri who live in ward #2 have hereditary rights to use Thakuri Ban. These rights have the double legitimacy of both length of use and caste status.

Data on the current holders of certain Thakuri Forest areas were obtained both from the villagers and from the Gahchowk Forest Office records. Nepali villagers have complex mental maps to locate and demarcate areas and places in their local surroundings. Thakuri Ban is divided into several smaller forest areas under local usage. The "close side" of Thakuri Ban (the side nearest the village) is called Dandabhangeri; the far side of Thakuri Ban is Thulo Pakho. Dandabhangeri is a sloping area of forest facing Lahchowk. It is the biggest forest area within Thakuri Ban. Thakuri, Chhetri, Gurung, Newar and Rana Bhat of Ward numbers 1, 2 and 4 are the main owners of Thakuri Ban. Thakuri Ban is described as located between Sarkari Ban, a government planted landslide area that was once within Thakuri Ban, and a water tank line boundary beyond which is Rana Bhat land. The Thakuri Ban areas described by villagers and forest office officials are as follows:

Areas	Castes	Ward	Type of Forest	Yr.Planted
Falia Kharka (Sarkari Ban)	Brahmin Thakuri	7,4	government plantation	2043-44 BS (1986-87 AD)
Dandabhangeri	Thakuri Chhetri Gurung Newar Magar	2,4	natural forest	
Dadre	Rana Bhat	1	communal forest	
Thulo Pakho	Rana Bhat	1	registered[14], plantation forest	planted 4-5 generations ago; registered 1990 BS (1933 AD)
Kandeni	Thakuri	4	natural forest	
Ghumse	Brahmin Thakuri	9,4	natural and planted	2044-45 BS (1987-88 AD)
Lam Danda	Gahchowk boundary[15]			

Altogether, the Thakuri users have 1 **mana** of land total. The Gurung, Gharti Chhetri, Thapa Magar and Newar have 2 **mana** total. The total size of Thakuri Ban is said to be 12 **pathi**[16].

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[14] This forest was planted by and registered to the Rana Bhat. It is not a government plantation.

[15] One part of the Lam Danda forest area is owned by Lahchowk people and the other part is owned by Gahchowk people. The most regular users of this forest are Sunar and Thakuri of ward no. 4. There is a conflict between the Gahchowk and Lahchowk people over this forest. Watchmen sent from both villages patrol this disputed area.

[16] Land is measured in the total amount (in **mana** or **pathi**) of **chamal** (uncooked rice) that a caste/ethnic group pays to the **heralu** yearly, rather than in actual area measured, for example, in hectares or square kilometers. The approximate weight of a **mana** is a pound. A **pathi** is approximately 4

In contrast to the ethnic and high caste households of Thakuri Gaun, Sunar - along with the other occupational castes - are resource poor. The Sunar do not own their own forest, and have no **bijan** in Thakuri Ban. Sunar explained that they have never given, and do not presently give, money or uncooked rice (**chamal**) to use Thakuri Ban. The customary form of payment to the forest guard or watchman from households which own **bijan** and exploit the forest is either money, uncooked rice, or both. Sunar, together with members of some of the other disadvantaged caste groups, have applied to the government for their own area of forest.

An old Damai man related a history of the Damai in Thakuri Gaun which helps to explain the historic factors which have contributed to the relative exclusion of the occupational castes from Thakuri Ban and other communal forest areas. The Damai forefathers never tried to obtain shares in the forest because the fuelwood shortage is a recent phenomenon. In the past the forest was plentiful, but now the Damai face many problems. They are not allowed to take timber from the forest, as are recognized users, and must pay a royalty to take it from the government Lekh forest. The Damai, however, unlike the Sunar and the Sarki, are not trying to get shares in communal forests. They are the poorest group in the village and feel they wield no power and do not have access to the proper channels.

Exclusion and inclusion (out-group and in-group) regulations concerning forest resources were determined generations ago in Lahchowk. Traditional high caste and ethnic group users continue to manage the forest. But while the ideology of use rights has not changed, management practices have. The protective measures taken by user groups have

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kilograms. But because a **mana** and **pathi** are actually pot measures of grain, and different types of grain are heavier and lighter than others, it is difficult to determine the exact weight of a measure.

increased to meet the new challenges of population pressure, forest degradation, and encroachment by villagers outside of the official user group.

2. Formal management of Thakuri Ban

Forest management practices do not exist independently; they are part of the continuous flow of interdependent activities which sustain life in the village. Speth writes that "...indigenous forest management practices are integrated into the flow of village life..." (1990:7). This continuous flow of activities is complex, interrelated, and interdependent. And because no two communities are the same, forest management systems vary tremendously in their characteristics and effectiveness. Throughout the hill areas "...there is a continuum ranging from an abundance to a severe scarcity of forest resources, and the attitude of people towards the use and management of the forest will vary depending on where they are along the continuum" (Gilmour 1990:147).

Resource management practices vary among ethnic groups, villages of the same ethnic group, households within the village, and individuals in a household. Communal forest, the main forest type discussed in this thesis, is described by Nepali villagers as an area of forest belonging to a specific caste or group of castes. Villagers named Thakuri Ban, Adhikari Ban, Poudyal Ban, and Rana Bhat Ban as such forests. The villagers have been protecting these forests "from the time of our forefathers". In Lahchowk, management practices of communal forests have two foci: 1.) the protection of the existing valuable tree/forest resources by restricting access to and/or exploitation of them, and 2.) the selective maintenance or purposeful regeneration and protection of locally valued species. Informants stated that the main objectives of forest management are to protect the resource base for future generations, and to meet current human needs simultaneously.

Most of the committee rules concerning access to communal forest resources in Lahchowk are still not official or legalized under Nepali law. The fundamental rule of "first come, first serve," refers to historical precedence, and rights of continual occupancy. Whoever has a family history in the village and, more importantly, a family history of paying the forest guard has formal rights of access under the present system.

As stated previously, each formal user household has **bijan** in Thakuri Ban. The size of the **bijan** shares is in proportion to the amount of farmland that the household owns. In this way, large landholders have larger shares in Thakuri Ban, while small landholders have smaller shares. This division is a **de jure** one; **de facto** use allows all share holders to utilize all areas of the forest. Each household's **bijan** is open to everyone else to exploit. No one knows where his own **bijan** is or how big it is, but he knows that he has a share and he knows how much total area the Thakuri Ban forest committee controls.

Formal user households are required to pay the watchman a prescribed amount of uncooked rice every year. The current forest watchman, a Thakuri man, has been working for 3 years as watchman. The amount in uncooked rice that a household gives yearly to the forest watchman is also determined by the size of the household's share in the forest. Those with smaller shares pay 1 **pathi**/year to the watchman; those with larger shares pay 2 **pathi**/year to the watchman.

The Thakuri and other owner households in Thakuri Ban have been paying a watchman for over 45 years now. "Thakuri Ban was owned by our forefathers, and we have always given mana-pathi to the heralu." Households that have become formal users recently (such as when a son sets up an independent household and applies for **bijan**), must pay to acquire forest land. This was not so in the past, but now forest land is limited and there is competition for **bijan**.

Ownership rights entail certain responsibilities for protection and wise use, especially with regard to communal or common property. The official body for forest management is the forest management committee (**samiti**). The Thakuri Ban committee is made up of members from six wards of Lahchowk: wards 1, 2, 3, 4, 6, and 7. Ward four (Thakuri Gaun) households have the biggest share in Thakuri Ban. The committee makes all of the rules and regulations concerning what trees to cut, when to cut them, and how they must be cut. The protection of trees and shrubs in particular seems to take two forms: prohibitions - such as the prohibition on cutting green wood - and restrictions - such as those on cutting religious species, and restrictions imposed on certain groups concerning forest use. For owner users, the prohibitions are few and relatively unrestrictive. Both owner users and access users may collect dry wood from Thakuri Ban, and there are no rules or regulations limiting the amount that people can take. Most dry wood is small twigs, however, and does not meet the needs of the user households.

In theory, owner user households are allowed to cut one green tree a year from Thakuri Ban; in reality, each household probably cuts several. In order to cut down a tree in Thakuri Ban for house construction, a request must be made to the forest committee, and once approved it is passed on for final approval to the District Forest Office (D.F.O.). Money from the sale of fallen trees in Thakuri Ban goes to the forest committee.

During the end of Chait (12th month of the Nepali calendar; see Appendix G for corresponding Julian months) and the beginning of Baisakh (first month), owner user households may go to Thakuri Ban to cut old green trees free of charge. The committee members first walk through the forest to assess its condition, and then go from household to household to tell the people what to cut. The committee assesses each family's needs and tells them how many basket loads (**bhari**) of fuelwood (**daura**) they may take from which old, leaning, dead and dying trees. They inform each household when to come with the committee to Thakuri Ban to collect their **bhari** loads. All of the owner user households must sign their names in the committee book. The villagers describe this process as "**hukum dinche**," which literally means that the committee "gives orders" of how much and what trees to cut.

It is only in the last two years that this annual species-specific controlled cutting has been permitted. In 1992, it was decided that each family could remove 5 **bhari** of wood. If the tree designated to a family does not provide 5 **bhari** loads, then villagers are permitted to cut branches from another old tree to make up the 5 **bhari**. In 1992, the forest committee decided that only **mauha** (see Appendix F for a table of Latin, English and Nepali species names) trees were to be removed between February 29th and March 1st.

Mauha trees are not preferred or considered particularly valuable; villagers stated that **mauha** trees are only used as fuelwood. As **mauha** shades other trees and inhibits their growth, the committee and the villagers decided to selectively remove this unwanted species. Another selection criterion for the removal of a species is its relative abundance. There were enough **mauha** trees in the designated forest area to supply every user household.

From a silvicultural perspective, it is beneficial to remove **mauha** from the area to aid good regeneration of preferred species, such as **chilaune** and **katus** (Nepali, pers. comm.). **Mauha** has a broad crown which shades surrounding areas and checks growth; cutting the branches of **mauha** creates open space for other more desirable species. **Godne** is the Nepali term applied to this process. Literally translated, **godne** means "clearing" and is a term used to refer to the removal of undesirable species to make room for more desirable trees. This procedure should not be confused with "thinning," which is removing dead and dying trees of many species.

A forest ranger from Gahchowk village stayed in Lahchowk for two days to regulate removal and ensure proper cutting techniques. This was an impossible task as all villagers cut at the same time. Despite this, rough guidelines were imposed: only the cutting of branches was officially allowed and villagers were not allowed to cut lower branches. Only old, dead and dying trees were supposed to be cut. Most of the villagers did not cut all of the branches on the tree so that new shoots would come quickly. The watchman and the committee members did not mark which trees were to be cut, but they restricted the cutting to the Dandabhangeri area within Thakuri Ban. Each year the trees are taken from a different area within the forest.

Many villagers complained that the cutting was haphazard. Some villagers argued that other villagers were cutting in the quickest, easiest fashion. For example, the cutting of healthy **mauha** trees in open spaces where they are not shading other trees provides no silvicultural benefit. In addition, the ranger gave villagers only a short verbal description of correct cutting practices, advising villagers to cut carefully, looking for small plants that could be damaged by falling branches. The committee merely requested villagers not to cut **chilaune** or **katus** trees and to cut only **mauha** branches. Many of the male committee members cut whole dead and dying trees, but when unsupervised they also felled good trees with bow saws. Upon questioning, these men claimed that high caste committee members were given permission to cut whole **mauha** trees. Apparently, the permission was granted by these same committee members to themselves. If there is excess wood after the annual cutting, the committee decides whether or not to sell it (at exorbitant prices) to the other villagers.

The committee felt that they had many problems controlling the cutters. A meeting held was held on the same day as the cutting and many women attended. Owner user households voiced their opinion that the lower castes should not be allowed into the forest because they will collect all the green left over branches that the owner households want for next year. The women suggested local monitoring of cutting so that while one group is cutting, the other group would be there to watch. The women also suggested that the committee should be stricter, taking away all of the wood collected from illegal cutters and imposing a fine. Several women suggested that each caste/ethnic group in the village should be allowed in the forest one at a time to lessen the chances of cutting and stealing preferred species, especially **chilaune** and **katus**. This idea, when put forward by the forest watchman, was adopted by the committee for next year.

After the **mauha** cutting all entry into this forest area was prohibited; this restriction was in force for 2-3 months so that the forest had a chance to regenerate from its heavy lopping. It also gave time for green **mauha** "left overs" to dry out so that everyone (occupational castes included) could collect them. During the two days of cutting, occupational caste women were hired to help the older women to collect their wood and, in return, were allowed to pick up small green branches that fell from the **bhari** loads of owner user women.

The committee members responsible for making decisions concerning forest management such as the annual clearing are all men. Occasionally women do go to meetings to tell the committee their needs and problems. During winter, for example, when enough fuelwood cannot be found to meet household needs, a group of women may decide to ask the committee if they can cut green wood from Thakuri Ban. But this happens so seldom that women really have no say in the management of the forest. Meetings are usually conducted in the early afternoon when women are unable to attend due to work and home responsibilities.

One particularly vocal woman, Dilmaya Sahi, sits on the Thakuri Ban committee whenever her work load permits, but she says that she is dominated by the men who make all of the decisions. She feels that the committee members are just trying to get money for themselves and that they exploit other forest users. As proof of this she cited the "auctions" at which the committee sells fallen trees to the highest bidder; the wealthiest people are able to buy trees (the money goes directly to the committee members) which are then cut into firewood and sold for a profit, and the poorest people who need the wood the most are unable to purchase it.

The committee estimates how many **bhari** loads of wood can be taken from a fallen tree, then calculates, at a certain rate (usually Rs.5/**bhari**), the cost of the entire tree. The tree is bought by an owner user, say for Rs.300, under the assumption that the tree will yield 60 **bhari** of wood. But in many cases there has been a gross overestimate of the potential **bhari** yield on the part of the committee, and the tree, bought for Rs.300, ends up producing a mere 15-20 **bhari** of useable fuelwood. Dilmaya also feels that the committee exploits the occupational castes. Thakuri and other owner users may purchase dead fallen trees from the committee. If the trees are not bought by the recognized user members then they are sold to access user households for 3-4 times the price they would command from owner users[17].

Dilmaya explained that women have no real voice in the management of the forest.

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[17] Dilmaya Sahi and her husband, owner users of Thakuri Ban, purchased two fallen trees that were put up for sale by the Thakuri Ban **samiti**. They paid Rs. 300 for the wood. The **adukshya** later told me that had these trees been bought by access users the price would have been Rs. 1200.

> First women must go to the committee and tell them that they need firewood. Then the committee goes to see what is available in the forest and tells the women what to go and cut. Before, the women used to decide among themselves. They would cut whatever they liked and hide it from the committee. Now, the government says that women must pay to cut green wood, so the women are afraid to cut green wood...

The committee thinks that, if left to themselves, the women will cut good green trees and deplete the forest. But Dilmaya and other Thakuri women feel that women of the user group would protect the forest because they have been practicing protective behaviour for many years. Dilmaya is convincing Thakuri and owner user women to attend committee meetings and take an active role in decision making. Many villagers agree with this view and feel that the right people are not on the committee. They think that committee members should be people who care about the forest but also have time to spend in the forest.

Right now the committee is made up of Thakuri and Gurung ex-servicemen who are educated but know little about the forest. Caste and gender dictate local political realities. Recognized power within the caste system, and formal power within the household, translate to political power within the community.

Thakuri women know about the committee meetings but usually have too much work to do. One woman said that when she goes she just listens and that none of the women say much. This is an accurate description of the committee meetings that I attended. When asked what decisions the women would make if they were active members of the committee, one of the older women replied,

> I can't be on the samiti [forest committee]. Who would look after my kids? I would not get any money for being on the samiti. I have no education and I have other responsibilities. I can't travel far to meetings and I have no good clothes to wear. And I don't know everything about meetings. What would happen when I didn't understand something? When I come home the kids would be crying and I would still have all of the housework to do. The men would not listen to the women anyway. We are neglected. We need a good education to be on the samiti. I can't even read.

Women in Thakuri Gaun are quite vocal about their dissatisfaction with the current situation. They express the desire to have their own forest committee chairman (**adukshya**). Women stated that "if we had more control we would take the dead and dying trees and help the new trees to grow. We would be able to protect the forest." They are willing to share 50/50 with the men, but they feel powerless at present.

> It does not matter how much women know about the forest and how much men do not know; women are not allowed to cut the good wood that they need. If the samiti says 'Take your five bhari from this tree only,' and the tree doesn't give five bhari, then that is too bad. You get only one tree...And we only cut what comes.

As the village grows there is more concern over the increasing pressure on the forest. Women complain to the committee about the condition of the forest, and say that there must be more forest guards to prevent both owner users and access users from cutting too much. It is not only the women who are concerned. The forest committee chairman and several prominent Thakuri men expressed concern that people from the neighbouring village of Gahchowk come to Thakuri Ban and cut green trees. They are afraid that if this continues, the forest will be gone in 2 or 3 years. They said that right now Thakuri Ban **bijan** holders are not cutting any green wood because of the alarming rate of forest depletion. That is the reason given why share holders do not want other people, who do not have shares in the forest, cutting in Thakuri Ban. They fear there will be a "tragedy of the ban". In addition, the Thakuri Ban owner users fear that if the government makes Thakuri Ban a government forest (like the Lekh), that it will vanish within 6 months, because people will not value or protect the forest[18].

The committee and the user households of Thakuri Ban are currently trying to solve some of these problems. They decided in the spring of 1992 to increase the number of watchmen from one to two; one watchman to patrol the near side of Thakuri Ban, and one for the far side. The current watchman complains that official forest guards are needed instead of just a "committee watchman". He suggests that the government should supply a watchman because one is not enough for a forest the size of Thakuri Ban. At the time of this study the committee had not chosen a second watchman but the consensus was that a strict man who has time to walk through the forest every day is needed.

There were 97 owner user households of Thakuri Ban in 1992, but the committee decided to allow three more households to join the user group. This increased number of 100 owner user households will mean that each household's annual payment to the watchman will be one **pathi** and each watchman will get 50 **pathi** a year. If they cannot get another watchman, the committee wants each caste group of users to pay the watchman for one year in rotation. The problem with this scheme is that smaller caste groupings would have an unfair burden. A possible solution would be to combine the smaller castes into a larger group for renumeration purposes.

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[18] These estimates of 2-3 years and 6 months are alarmist; by the estimates of foresters who are familiar with this forest, serious degradation and depletion will take 10-20 years under the current use system.

The forest committee also decided on new fines for those who abuse the forest. If the watchman catches people taking green wood, he can fine them 20 Rs. If he catches them taking bamboo illegally, the fine is 40 Rs. Half of the fine goes to the committee and half to the watchman as an incentive for vigilance.

This section has discussed the formal system of forest resource management. I have shown that the people who are making these formal decisions are most often higher caste men, with access to relatively greater financial and natural resources than the other villagers in Thakuri Gaun. Other researchers have noted that inequity is marked in communities with distinct divisions of caste and a real disparity in income distribution. Indeed, I would argue that it is often wealth - that is the access to or control over important economic resources - which is the most striking indicator of status, and indeed inequality, in Nepalese communities. It is usually the case that the more resources a person has the more power that person has. Wealth frequently brings access to more resources and serves to cushion against disaster[19] (Seeley 1989b, 1989d).

Wealthier, higher caste members of a community usually have the loudest voice in decision-making. It is optimistic to suggest that the powerful members of the community, usually wealthy high caste men, will be likely to represent the views of women, the occupational castes and the poor. Those in power frequently oppose and frustrate measures which aim to bring about change and social reform. But formal rules are often ignored by those who have few resources and little control.

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[19] An example of this is the behaviour of the Thakuri villagers. After meeting their own household needs with forest products collected from Thakuri Ban, they go to the government forest to collect fuelwood to sell so that they can increase their cash resources.

Although women may not attend public meetings, they traditionally make informal decisions regarding utilization or closure of a community forest resource or common land, particularly when they are the ones responsible for grazing or collection of fuel and fodder from that area. Despite the public denial of women's voices in Thakuri Gaun concerning resource management, women do have informal, unsanctioned control over forest management through their frequent use of resources. The next section discusses management and utilization practices within Thakuri Ban that undermine or fall outside of the formal management system.

3. Informal management and illegal practices

Official use of the forest is regulated by the committee, but the day to day extraction of resources is based on individual decisions made by village women. It is critical to recognize that management is not necessarily an agency with deliberate intentions but is practiced whenever people produce patterned outcomes in natural resource use and availability regardless of whether or not prior intention was present, absent, known, or unknown (Acharya 1990). In this way, management is the sum of culturally patterned behaviour.

What follows is a presentation and discussion of data concerning the seasonal utilization of forest areas by groups of women, and a discussion of utilization patterns and **ad hoc** management techniques practiced by village women. Tables containing seasonality and location of fuelwood species can be found in Appendix B.

Data collected on seasonality both by observation and through interviews and exercises confirms that there are general patterns of exploitation which vary by caste both seasonally and according to forest area. The Sarki reported that they collect all tree species year round. The number of species collected year round by the Sunar was recorded as 5 out of the 7 species named, which at first seemed low compared to verbal accounts which indicated that Sunar women collect fuelwood all year round. But what must be taken into account is that three of the species reportedly not collected year round are found exclusively in the high Lekh forest which is difficult to reach during monsoon. All villagers, except the very poorest, avoid the Lekh area during monsoon, from Jeth to Bhadau. The Sunar do go to the forest more often during the rainy season than do the higher castes, but they restrict their collection to forests closer to home.

Information provided by high caste women on seasonality suggests a high number of species which are collected year-round. This seemed to contradict other data which showed that high caste women gather firewood for only 6-8 months of every year. A possible explanation for this incongruous information is that several of the species reportedly collected year-round come from near-by communal forests, from which a **bhari** of wood may be collected within two or three hours. Occasional collection of species found in communal forests during these months is not unusual. Another possibility is that some of the high caste villagers were reporting months that tree species are able to be cut, rather than months when they are actively cut.

The group of Brahmin villagers who live just outside of Thakuri Gaun reported the lowest number of species lopped year round. This is not surprising, as the Brahmin have the most labour in their own fields pre- and post-monsoon. In addition, the communal forest area belonging to the Brahmin households interviewed for this exercise, Ghumse Ban, is in good condition and enough wood can be taken during the six agriculturally slack months to last all year.

Several women from different Thakuri households, and even some of the older Thakuri women, reported that they either had never been to the forest or seldom went. One of the reasons for this is that a number of Thakuri households obtain fodder from their own land and buy fuelwood from others. Most Thakuri women, however, said that they go often to Thakuri Ban for both fodder and fuelwood.

Most Thakuri go to both Thakuri Ban and the Lekh. In addition to meeting their own household needs, the women of several households collect additional fuelwood which they sell. The women reported that they travel to the Lekh during the winter months - Mangsir and Poush - to collect good fuelwood species because they are not allowed to cut **chilaune** and **katus** (the highly preferred species) from Thakuri Ban. Neither are they legally allowed to collect these species from the Lekh, but the women reported that the absence of an official watchman in the Lekh makes it easier to cut illegally. Much illegal cutting by both high caste and occupational caste villagers occurs in the Lekh. Thakuri women cut both dry and green branches in the Lekh, often climbing trees to cut large branches[20].

Women of all castes stated that the best daura is found in the Lekh, and listed **jingano**, **machaino**, **phalant**, **dabdabe**, **sil timur**, **katus**, and **chaap** as the most common species found in the Lekh. During the spring and fall Thakuri women mainly exploit Thakuri Ban. Although the dry wood in the Lekh is more plentiful and easier to find, the Thakuri say that they prefer to stay within their own forest. Unlike women from the occupational castes, Thakuri women are able to practice fuelwood selection, collecting mainly preferred species that are easily available, such as **katus** and **chilaune**. The fuels that do not burn well, but are easy to find and light to carry, are used only as filler fuels when preferred species are unavailable.

Thakuri women do not go to the forest during the monsoon because of the leaches: they collect 15-25 **bhari** (depending on family size and need) of large fuelwood in Phalgun-Baisakh to last them through the four months of monsoon. All villagers reported that only poor households who do not have enough fuelwood must go to the forest during the rainy months.

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[20] On several occasions, while travelling with village women to the forest, I observed illegal cutting behaviour such as that described above.

At first many Thakuri women claimed that they themselves do not practice illegal cutting within their own forest. "It is the older women," one woman explained, "who climb the trees and cut green branches." Many women initially stated that because Thakuri Ban is their own forest they bring only dry wood. They explained that they are afraid that the watchman will find out if they cut green wood and they will get a bad reputation in the village. "It is mostly the lower castes who cut green," stated the women.

But many women later admitted, when their husbands and other villagers were not present, that it is not only the occupational castes who cut illegally. One old Thakuri woman described her illegal activities in Thakuri Ban: she cuts green **katus** in the morning and hides it. "It has dried out by the end of the day when I bring it home from the forest and it burns very well." Most women eventually confided that they cut green branches in Thakuri Ban, then hide them under shrubs[21] and in hollow trees (called **phokse**). On their way back from the forest in the early evening, they collect the branches which have dried sufficiently to elude the watchman in his search for green wood.

A Thakuri woman, Prema Sahi, reported that "now I cut only dry branches, whereas 5-6 years ago we [she and her friends and relatives] used to cut green wood from Thakuri Ban. Now it is hard because of the protective measures enforced by the committee." She says that she still cuts green wood occasionally out of necessity and hides it from the watchman. An old Thakuri woman remembers: "When I was young we would cut whole green trees from Thakuri Ban. Now we have to climb trees to get dead branches."

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[21] The women being interviewed named several types of shrubs which provide good hiding places for green wood: **muni**, **bilowne**, **chutro**, and **aiseelu**.

Thakuri women reported that all castes occasionally go to the forest to steal green wood at night. The watchman is aware that women hide green wood and sneak it out of the forest in their **bhari** loads but he feels that the women have no respect for or fear of him and that his authority is minimal. He also scolds women for digging up roots for fuelwood because the roots are alive and can sprout again. He says that all of the women, regardless of caste or user status, cut green wood, but that "the main reason for forest reduction and degradation is the practice of taking dry wood and leaf litter so that nothing can grow."

All indigenous knowledge is not beneficial in terms of sustainability and quality of forest resources. In addition to cutting green wood and hiding it, villagers sometimes practice what I call "long-term" lopping. Trees along the main forest trail are "whacked" with a sickle as the villagers walk by, so that after several months of this lopping the tree dies. The dead tree is now classed as dry wood, and can safely be taken from the forest. It is mainly children that engage in this type of extraction behaviour. It was explained to me that this type of lopping in communal forest areas - areas close to the village - reduced walking time for the children and made collection of dry wood easier.

Sunar are permitted to collect dry twigs, branches, and shrubs from Thakuri Ban. But the penalties for violating Thakuri Ban forest rules are strict: if the Sunar are caught in, or coming from, Thakuri Ban with green wood or even a few green leaves on their fuelwood, their fuelwood, baskets, and cutting implements are confiscated. While collecting fuelwood, the Sunar girls and women pick up dry twigs and branches and strip any remaining green leaves off, for even though the twig is dead, green leaves could mean trouble. Women reported that they must hide if the watchman or other people (owner users) come; after they have passed by the women run away.

Many Sunar women expressed their resentment of this situation. They feel that the Thakuri are wrongly accusing them of poor lopping techniques and that it is the owner users who are to blame - as much as them - for forest degradation and destruction. The Sunar gave an example of this contradictory behaviour, stating that Thakuri households "cut more than the one green tree a year" that the user group rules state may be taken from Thakuri Ban.

In addition, it was the Sunar women who were able to describe to me practices which aided tree growth, while most Thakuri women were ignorant of these techniques. For example, Sunar women practice coppicing of trees: if the trunk is straight and healthy at the bottom but the top is irregular, they will lop the top off for firewood. After this, the tree reportedly grows back straight and healthy. The women then hide the coppiced portion (because it is green) and return to collect it when it has dried out sufficiently. Sunar women stated that they cut only the dwarf, stunted green trees because those are the ones that will not grow tall. "The trees that will grow tall we do not cut." This practice is described by foresters as selective removal of unhealthy trees. It is an excellent example of an informal management technique employed by forest "users" who are outside of the formal user group. The Sunar explained that they do not cut the trees that will grow tall because when these tall trees die the Sunar can cut them for dry fuelwood. Sunar women explained that they lop branches off carefully so that they "will grow back in a good way." Sometimes, instead of cutting branches, they cut only the thorny part off to use as fuelwood.

But sometimes the Sunar do cut green branches and small trees, which is prohibited. Like the Thakuri women, they then hide the green branches until they are dry enough to remove from the forest, or they hide them inside the dry wood of their **bhari** loads and bring them home to dry them. They also chop and peel the outer bark from green wood so that it will dry faster. "It is hard," the Sunar women said, "to find dry dead wood after the monsoon, and we must do as the old women do, climb trees and cut green branches"[22].

The Sunar reported that the necessity to cut green trees arises because so many people ("everyone") goes to Thakuri Ban and there is, consequently, not enough dry fuelwood. They make the association that the forest situation is getting worse because of the population problem. The older Sunar women said that they must go to Gahchowk Ban and Reban Ban in winter when there is not enough fuelwood to be found closer to home. In these forests women collect fodder, bamboo (**nigaalo**) for baskets, and small trees for fuelwood and building animal stalls. Although Reban Ban is further away than Thakuri Ban, Sunar women go to Reban Ban because for 10-12 rupees a **bhari** load - paid to the Reban forest watchman - they are allowed to collect green fuelwood. However, many of the poorer Sunar women "steal" green wood from Reban Ban, hiding it first then bringing it home later.

Many Sunar women reported that in Thakuri Ban they cut carefully, but in the Lekh they cut quickly and carelessly. Sunar women go to the Lekh during Mangsir-Magh. They explained that all castes exploit the upper Lekh and cut anything they want. Also, the Lekh is very far away and it takes a full 12 hours to get up and down again. Hence, the women believe that because so many people go to the Lekh that they must cut a lot and that because the forest is so far away they must cut quickly. Sunar women feel the double pressure of availability (many people using a rapidly depleting resource) and accessibility (resource is far away which imposes time constraints). This has impacts on the forest in the way that people cut and harvest.

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[22] On a fuelwood gathering expedition with occupational caste women I observed an old Sunar woman high in the branches of a tree, lopping off green branches. The woman stopped cutting when she noticed me watching her. When I inquired as to what she was doing, she replied, "Cutting dry wood." As we continued to watch, she made an effort to find and toss down some dead branches of **chilaune**, a preferred firewood species. As I walked off, I again heard the sound of a sickle on green wood, and turned again to see green leafy branches falling to the ground.

Village women know that if they went to the Lekh for one month continuously, every day, that they could collect enough fuelwood to last the entire year. But this intensive exploitation would be impossible for the women. It would be too physically demanding, especially for older, ill, or pregnant women. In addition, there are other responsibilities and demands on women's time: most notably the responsibilities of the home and the farm.

All of the Damai households within Thakuri Ban exploit Poudyal Ban to meet their fuelwood, fodder, and forest products needs. The rules pertaining to forest exploitation by non-**bijan** holders in Poudyal Ban are similar to those in Thakuri Ban. Access users are permitted to collect dead twigs and branches, but they may not take green wood and must pay to remove dead, fallen trees from the forest. The reasons provided by the Damai for not exploiting Thakuri Ban were proximity and tradition. They feel that Poudyal Ban is easier to get to than Thakuri Ban, and stated that their ancestors have been going to Poudyal Ban for generations. Although the Damai often said of Thakuri Ban that "it is too far from here [our houses]," in actual fact the two forests are approximately the same distance from the Damai area. Observation and forest committee records of fines bear out the fact that the Thakuri Ban watchman is stricter than the Poudyal Ban watchman, and perhaps this is one of the reasons that the Damai avoid Thakuri Ban.

The monsoon is the heaviest season of exploitation of Poudyal Ban for the Damai. The Poudyal Brahmin do not go to the forest during the rainy months both because of slippery trails and leaches, and because they do not feel forest resource pressure as the occupational castes do. For five months out of the year, Mangsir to Chait, the Damai travel to the Lekh for forest products.

Initially, Damai women claimed that they do not cut green wood, but in an interview several months later the women named four fuelwood species which they do cut green in Poudyal Ban. "We must hide this green wood from the watchman and run away when he comes...we have no choice but to steal wood from Poudyal Ban." Damai women are often caught with green wood by the Poudyal Ban watchman. The first few times a woman is caught, the watchman just gives her a verbal warning. But if she is caught again, he takes her fuelwood, confiscates her implements, and occasionally fines the woman as a penalty for cutting green wood. A group of Damai women said that they prefer to take green wood from the Lekh, where there is no watchman.

The Sarki said that, without their own forest, life is very hard for them. Every year those who have forest cut trees and green branches, but the Sarki cannot so it becomes harder and harder to get fuelwood. "From the time of our forefathers we have been denied a share" they claimed. The men from Sarki households say that they are willing to pay the watchman and protect their own forest, not just for the products that the forest provides, but for the forest as a place with intrinsic value. One man added, with insight, "Those who do not have forest do not care about the forest of others because it is not their responsibility."

The Sarki, too, go to Poudyal Ban "because it is closer." This statement is even more questionable than when made by the Damai, both because the Sarki live next to the Sunar - who exploit Thakuri Ban - and because I determined that the Sarki households were approximately 25 minutes closer to Thakuri Ban than to Poudyal Ban. Another factor which might come into play here is the "social strength" of the caste. The Sarki and the

Damai are the two weakest and poorest castes in Thakuri Gaun. They are afraid of confrontation with the high caste watchman, and cannot afford to pay the penalties if they are caught with green wood. The Sunar, on the other hand, are more powerful in numbers and in resources. The Sarki and Damai prefer not to make trouble; the Sunar militantly assert their rights to forest resources. Another reason given by the Sarki for going to Poudyal Ban is that there are more shrubs and smaller trees in this forest. The Sarki women explained that, as they do not know how to climb trees, they must cut dry shrubs[23].

Sarki women also go to the Lekh as it is very difficult to obtain enough dry fuelwood from Poudyal Ban. The older women go to the Lekh almost exclusively, the exception being when they are very busy planting and weeding and harvesting. Sarki women try to avoid going to the forest during monsoon because of the leaches, but this is not always possible because of their poverty. At other times of the year the women travel to the forest every day.

Sarki women emphatically denied cutting any green wood. They claim that if they cannot find enough fuelwood, they just return home because they are afraid of being caught with green wood. This may be true, although Sarki women's knowledge of what trees burn the best when they are green suggests that perhaps knowledge has followed experience[24].

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[23] The woman who told me this also pointed out that because the Sarki do not climb trees, they do not steal green wood like the Sunar do! The phenomenon of climbing trees is definitely caste-specific. Sunar, Newar and Brahmin women, and some Gurung women, climb trees; Thakuri, Sarki, and Damai women rarely do so. I questioned women - and men - closely as to why this was the case, but I invariably received the answer "We are simply doing what our mothers did or did not do." In other words, either nobody really knows, or nobody is telling.

Newari women said that they try to get as much dry wood from Thakuri Ban and the Lekh as possible because green wood is too heavy. It is mainly young girls who are sent to Thakuri Ban while the older women go to the Lekh. They often must resort to non-preferred species because there are not enough good fuelwood species readily available in Thakuri Ban. In Thakuri Ban they claim that they do not cut any green branches; they collect only dry twigs. They do, however, collect the green or semi-green branches that people have hidden or forgotten to collect. Newari women go to the Lekh in Mangsir-Chait. In the Lekh, the women climb trees to cut the green leaning branches. Neither of the families go to the forest during the monsoon season.

Thapa Magar women stated emphatically that they do not get green wood from Thakuri Ban, and observation bears this out. Magar women used to get green wood from the Lekh but they seldom go anymore due to their new economic resources. Most of the time these families buy fuelwood, and only rarely go to the forest.

The Gurung feel very strongly about proper forest management. The Gurung men feel that it is those who are not shareholders in Thakuri Ban who are destroying the forest. "The shareholders protect the forest," they asserted. "Low caste people go out at night while everyone is asleep and cut green wood." The men say that something must be done to stop this and that there should be a government office in Lahchowk responsible for providing forest guards and night patrols of the forest. They suggested that 60% of low caste people destroy the forest and only 40% try to protect it. This figure is probably fairly valid, although "destroy" is perhaps not an accurate term to describe occasional maladaptive extraction practices. As well, I feel that these same percentages could apply to high caste villagers.

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[24] An example of this fact from interviews:
Researcher: What trees burn well when they are dry?
Chija Sarki: Most burn better, like mauha, dabdabe, ruktachandan.
Researcher: What trees burn better when they are green?
Chija Sarki: Chilaune, when not dry, gives a good flame.
Researcher: What does "not dry" mean?
Chija Sarki: Well...wet...green.

The Gurung, like the other share holders in Thakuri Ban, also practice illegal cutting. A main female informant stated that "chilaune and katus, if not fully dry, give a good flame. Other species, such a kafal and malaado, need to be dry to produce a good flame." This indicates a knowledge of the burning properties of green wood and suggests that collection of green wood is not uncommon.

As I have shown, women's decision making is largely informal. Every time women go to a forest to collect forest products they make decisions about what products to take and what products to leave. These decisions are made on the basis of their knowledge about trees and forests and the needs of their households. These decisions amount to **ad hoc** forest management, whether there is an overall plan or not. Women apply proper exploitation techniques whenever possible, and they are aware of the consequences when they compromise good management practices in favour of household fuel requirements. Forest management systems need not always be formally designed or orchestrated; rather, they can be the outcome of patterned decision-making and resource exploitation.

It is the women who decide when to go to the forest, which forest area to go to, how to cut, how much wood to cut, and what trees to cut. One of the research questions asked of the women was "Who decides within the household when it is time to get fuelwood and how much the family needs?" Women replied unanimously that they themselves decide how much they need and how long it will last. When they have to work in the fields they cannot go to the forest. So when they are not busy they get up early and go and get a lot of fuelwood to last them through the times they cannot go. If a large group of owner user women decide that it is too hard for them to get enough fuelwood for the whole year, they can approach the committee to obtain permission to cut green wood from Thakuri Ban.

During winter some of the wealthier households buy fuelwood. Working males of the household generally give women the money they need to buy the wood but the decision to buy wood is made independent of male family members: "The women decide themselves. Husbands never take part in these decisions. If men get one bhari from the forest, they think that they have worked hard enough for the whole year. If women ask for money to buy daura, their husbands scold them for being disabled and lazy." Although women do make significant decisions concerning the exploitation and allocation of forest resources, women are not recognized as decision makers and, consequently, their decisions are not regarded as being important ones.

Inserra (1988) argues that those who utilize the forest (including the disenfranchised occupational castes) should also be responsible for decision-making and managing the resource. She also argues that women should be on committees because they tend to make different, and presumably more appropriate forest management decisions than men. I agree that the most appropriate choices would be made if those who use the forest most had the most decision-making power concerning the management of forest resources. But we must not suppose that the establishment of an equitous decision-making structure would ameliorate the underlying conflicts. Conflicts between groups of people in the village, be they gender-based groups or caste-based groups, are cultural conflicts that are played out in the environmental arena. I now turn to a discussion of management and conflict in terms of owner users and access users, and real and ideal behaviour.

4. Owner users and access users

The Hindu caste system, which operates in most of the terai and hill areas of Nepal, has institutionalized unequal control over and access to resources. Thakuri Gaun, being a multi-caste/ethnic ward, is a prime example of a community in conflict over its resource base. The most obvious representation of this is the unequal access to the "community" forest, which because of this unequal access is actually a "communal" forest. Owner users are villagers who belong to the formal, locally recognized, locally institutionalized group of users of a specific communal forest. These owner users possess **bijan** within the forest and select people from within the user group to sit on the committee. Brahmin, Thakuri, Gurung, Newar, Thapa Magar, and Gharti Chhetri are all owner users of forest plots within Thakuri Ban. Access users, on the other hand, exploit the communal forest, but are outside of the local institution of user groups. Access users belong to informal, unrecognized groups of users who have access to, but no rights within, the communal forest and no representation on the committee. These access users include the Sunar, who use Thakuri Ban, and the Sarki and Damai, who have access to Poudyal Ban.

An FAO publication states that "[P]erhaps the most concrete management concept to emerge from communal forestry experience to date is that successful management groups need not be geographically defined by village or panchayat, but rather by user groups with a shared interest in managing the particular resource" (1985:64). Inserra supports this viewpoint when she writes that

> 'Community forestry' refers to management of forests by the local villagers who depend on them...Local 'users' should be involved in every aspect of forest management...The vehicle for management by villagers is committees or user groups (1988:2).

Based on our previous discussion, these statements must be viewed with some caution. Owner users do not always practice "ideal" behaviour, and neither do access users always practice destructive or deleterious behaviour. It was during one of my trips to the forest, while I was observing an owner user woman surreptitiously strip leaves from a tree branch, that I came to the realization that I had to examine not only the conflict between groups of owner and access users, but also the conflicts taking place within individuals. This conflict arise when individuals were forced to depart from what they know to be ideal management because of the very real necessity of procuring fuel in the face of increasing competition over scarce resources.

In addition, ownership of resources and membership in a "user group" are not always synonymous with forest use or indigenous forest knowledge. Brokensha writes that "from the viewpoint of local people, divided communities are more common than homogeneous ones. When there are divisions (whether based on caste, ethnicity, religion, land- holding, income, gender or age) it is not easy to find a small group of individuals who can effectively represent a 'community'" (1987:235). Messerschmidt (1991), too, writes that the word "community" is of little use in implementing community forestry because it does not designate or describe the heterogenous nature of the social groupings. Instead he suggests that the notion of an "interest group," following Gilmour and Fisher, is much more helpful. The concept refers to a group of people who have similar sets of interests in respect to a particular situation.

But despite concessions to the heterogeneity of rural communities, the dominant belief among foresters and developers is that "real" users and "ideal" users are the same. They often ignore the reality that villagers outside of formal user groups use the forest. Gilmour and Fisher write that "...non-users [people not in the user group] are rarely in a position to make informed decisions about the forest or the needs and wishes of the users [user group members]" (1991:47). It is argued that it is already known by convention who the actual users are; those who have been paying **mana-pathi** are the genuine users. My research flatly contradicts this assertion.

While this may be true in some villages, it was far from reality in Lahchowk. In reality, many of those who are poor, or who are excluded from clan or group forests, enter the forests illegally to cut and remove forest products. Are they, although illegitimate users, not genuine users? My research reveals that real behaviour does not coincide with the notion of the ideal user group.

The above statements are extremely important ones in the Nepali context when considering the rights of occupational caste villagers. One of the misconceptions which I challenge in this thesis is that the forest committee and the user group are the bodies which possess the most indigenous forest knowledge and have the most influence on forest use. This is not necessarily the case. In Lahchowk, more people outside of the locally recognized user group exploit the forest than do locally sanctioned users. The unofficial users, or access users, who do not sit on the forest committee or own plots of forest therefore have great impact on forest resources, and these users are invariably from the occupational castes. In addition, forest user committees are often externally generated groups; their membership and structure are determined by outside agencies and forces. Consequently, many user groups and their committees do not adequately represent local management reality or reflect the local richness of forest knowledge.

"Forests are the single most important resource to rural communities providing food, shelter, [fuelwood, fodder], and spiritual needs. However resource users often lack legal rights to local forests or are unable to influence...laws that dictate their fate" (Cabale and Zazueta 1992:33). Unfortunately, the support of Nepali law for the present system regarding access, and the increase in village population and the concomitant decrease of forest resources have served to disenfranchise the poorer and lower caste groups. In Nepal, "[B]oth socio-political expedience, and ecological exigencies define the...rules..." (Niamir 1988:22).

> As a result of the marginalisation of indigenous technology the patterns of technical change which impinge upon the rural poor have a number of undesirable effects... they may make uneconomic use of local resources as inputs to production. The techniques may have...structures with technical...characteristics which lead to their use exclusively or disproportionately by higher income groups, or which lead to a further concentration of control over local resources or locally generated income in the hands of such rural elite groups...The outputs of the new production systems may meet the consumption demands of only relatively privileged groups rather than basic needs of broader sections of the population. They may fit ill with the local cultural or natural environment, leading to losses in local welfare--even if some individuals or sub-groups do benefit" (Bell 1979:46).

As a consequence of their limited access, some occupational caste people are forced to exploit the local forest by stealth. They feel, in response to their insecure forest situation, the need to collect forest products hastily, which often results in improper cutting and lopping techniques. This improper cutting is not due to ignorance or apathy, it is a reaction - to fear and necessity: "When we cut in the forest we do not have much time. When other people see us, they sometimes start trouble, so we cut in the easiest and quickest manner..." (Speth 1990:60).

In sum, communal or caste-based forests in Nepal are managed by forest committees made up of representatives belonging to a particular caste, or particular group of castes with similar caste status. The communal system, therefore, implies exclusion of other castes within the community through restrictive rules of management, access and use (Balla et al. 1990). Among the most hard pressed are the poorest and usually the lowest caste people, such as Sarki, Damai, and Sunar. Under the archaic communal/caste-based forest management practices of Lahchowk village these people are excluded, since "ownership" of these forests remains in the hands of the more powerful and affluent upper castes. While occupational caste villagers do exploit (with the knowledge of the Brahmin, Chhetri, and other owner users) higher caste communal forests, access by the occupational castes to communal forests is precarious and constantly in dispute.

The village is heterogeneous in terms of caste, gender, age, and socio-economic status, and this heterogeneity is reflected in a variety of use patterns and knowledge systems. While differences between individuals and groups have always been the cause of conflicts within the village, institutionalized inequality of access to forest resources, coupled with increasing forest degradation, has exacerbated these conflicts. Thus it is not only heterogeneity which is at the root of the current conflict between access users and owner users, but resource scarcity. Deviations from ideal utilization patterns are caused by resource scarcity and result in conflict. It will now discuss these conflicts.

5. Conflicts

Brokensha and Castro state that "[g]enerally, communities lack the necessary cohesion, homogeneity and tradition of cooperation that make communal... [forestry] likely to succeed" (1984:18). As we have seen, different groups within the village place different demands on specific forest products. And the control of tree and land resources, as well as the management responsibility for these resources, are invested in groups which do not include all users. "Communities are not monolithic entities and cannot be treated as such. [There are often] conflicts between different groups at the community level" (Rocheleau 1987b:60).

Within Thakuri Gaun the main division is between the Thakuri, the majority group within the ward, and the Sunar, the next largest group. The other two occupational castes within Thakuri Gaun, the Sarki and the Damai, are smaller in number, not as cohesive or vocal in their demands as are the Sunar, and exploit forest areas owned and managed by high caste villagers from other wards. There are similar conflicts between Sarki and Damai and the owner users of the forests they exploit, but these conflicts are on a smaller scale than the one to be discussed here[25] - the conflict which involves 75% of the villagers within Thakuri Gaun.

The Thakuri are formal owners and managers of Thakuri Ban. The Sunar exploit Thakuri Ban, but do not belong to the locally recognized user group. User group members pay the watchman each year, receive 5 **bhari** of green wood every year, and can take part in the decision-making process concerning the forest. Sunar do none of these things, yet they are still permitted to go into the forest and remove dry wood and leaf litter. Neither group is satisfied with this situation. The Thakuri feel that the Sunar are getting "free" wood, with no obligations or real interest in proper forest management. The Sunar, on the other hand, feel "dispossessed" and want their own forest area within Thakuri Ban.

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[25] The villagers of Thakuri Gaun are involved in intra-village, as well as inter-village, forest conflicts. The area of government forest above Lahchowk, the Lekh, is an area to which access is greatly disputed by three separate villages - Lahchowk, Reban, and Gahchowk. The Gahchowk villagers that I interviewed named the Lekh areas which Reban and Lahchowk villagers use as "Gahchowk forest". Since the forest office at Gahchowk was only established BS 2040 (1983 AD), there are no records in existence which would clarify traditional rights to the areas in dispute. The forest officials from the D.F.O. in Gahchowk have stated that Lahchowk villagers can use the area of Lekh which borders the registered Lahchowk forest area. But the villagers of both Gahchowk and Reban claim this area as part of their own traditional forest lands. These are not passive disputes, as most of the intra-village disagreements are. There is no social incentive to maintain harmony between the villages, so many arguments within the forest between the residents of different villages turn violent. The forest committees of all three communities are requesting the D.F.O. to send an impartial forest watchman to the Lekh to establish order. So far this has not been done.

Access group members pay more for green wood (to the D.F.O.) than do owner group members, so this is a double burden: not only do they not have their own forest, but they must pay more for the wood which they so desperately need. A Sunar man reported that when the occupational castes (mainly just the Sunar) appeal to the D.F.O. in Gahchowk, they are assured that the Thakuri are willing to give them forest land. But when they return to Lahchowk, the Thakuri and other formal users refuse to give them any.

This contradicts the Thakuri view point. The Thakuri Ban General Secretary, Surya Bahadur Uchahi Thakuri, claimed that "those people who have forest and are familiar with dealing with the government are willing to help those [occupational caste access users] who don't have forest and who don't know how to approach the government." The Thakuri men say they are willing to help the occupational castes approach the government concerning the handing over of a nursery area on the lower slopes of Thakuri Ban. In addition, owner users of the forests surrounding Lahchowk have met to discuss giving forest areas in Chiso Pani to access users from wards 1 and 2; areas in Dhanda Pakho, Betino Pakho and Kalmati Pakho to access users from wards 4, 5, and 6; and the area above Ghumse Ban to ward 7, 8 and 9 access users. All of these areas are plantations where only **utis** is highly successful, so access users are not satisfied with this offer and continue to voice their desire for shares within natural forest area.

The response of the Sunar angers the Thakuri; they claim that the Sunar want a forest but are not willing to pay. "We have offered the Sunar a nursery to look after that will be ready for lopping in 3 or 4 years, if not sooner. But they want an established forest, and will not look after the nursery...If they want a forest they must apply to the D.F.O., and pay a royalty to the government." This issue will not be dealt with, however, until after ward elections have taken place. There have been no elections since the revolution so there is no one to take the communities' problems to the government. D.F.O. workers in Gahchowk told the Sunar that because of the upcoming elections nothing can be done for them presently. This is but one of many examples of the coordination problem between the D.F.O. and the local forest committees. Neither will take responsibility for the situation of the disenfranchised occupational caste villagers.

There are several other problems which present themselves here. Firstly Thakuri Ban is not legally the Thakuri's to offer as it is an officially designated Government Forest. Secondly, the nursery is basically a mono-species plantation with good primary growth of **utis**, only marginal secondary growth of **chilaune** and **katus**, and some regeneration of **mauha**. This species composition is inappropriate to the needs of the Sunar: both the women, who require a variety of species for fodder and fuelwood, and the men, who need certain species for goldsmithing. Thirdly, although the Thakuri claim that the Sunar are not willing to pay the forest watchman for his services, this is untrue. What the Sunar do refuse to pay is the approximately 200 years of back payments that the Thakuri demand. The Thakuri told me that if the Sunar are willing to provide the back pay of five generations of **pathi** to the watchman, then they can have a share.

Many Thakuri complain that Sunar women take all of their fodder and firewood from Thakuri Ban, instead of making the trip up to the Lekh to collect forest resources[26]. "Our women have to go to the Lekh to get dry wood. Are the Sunar willing to work this hard? No, they want it easy in Thakuri Ban." The Thakuri stress that rights to the forest follow from meeting obligations and being responsible.

Owner users fear that the Sunar and other occupational caste groups will jeopardize their own good standing with the government. If anyone cuts green trees illegally, the government - they feel - will have no mercy. The precedent for this opinion was set when a landslide occurred in the village and the government, claiming that the villagers had been negligent, initially refused aid. Much later, however, the government did plant a nursery on the eroded area.

The Sunar explained that their forefathers did not pay the watchman; everyone just cut green wood because there was a lot of forest. Up until only thirty years ago the Sunar collected green wood from Thakuri Ban. Although it was prohibited, because the forest was plentiful nobody minded. But now, the rules are hard and fast. An old Sunar woman added that "...if the Thakuri were in our situation, they would cut green wood illegally too. But only Rana Bhat, Gurung, Thakuri, Chhetri and Brahmin have forest. The Sarki, Damai, Sunar, and Kami have no forest."

A group of occupational caste villagers agreed that all occupational caste households are willing to pay a watchman and protect the forest. But they claim that the Thakuri have good ties and contacts with the government, enabling them to keep the forest for themselves. Before the revolution, a group of Sunar and Sarki complained to the government, asking for a share in the forest and equal rights with owner users to receive the **bhari** loads of green wood at the end of each year. The government proclaimed that there were no rules to make the committee give wood to "non-user" households. The Thakuri Ban user group still abides by this government decision, and exclaim,

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[26] My data suggest that the majority of the users of the Lekh are from the occupational castes, not the higher castes.

> ...the lower castes use our forest. They take our fodder and firewood. They have the same rights as the share holders [apart from the 5 **bhari** of mauha at the end of each year], so what more do they want?! And no matter what the government is - Communist or Congress - it will recognize the rightful users, the people who have protected the forest for years...

The committee are sure that the D.F.O. will never allow the occupational castes official rights because the forest simply is not sufficient: "There are thirty-four households of Sunar alone in Thakuri Gaun, too many to give shares to. The government is planning to conserve and preserve the forest like we are. The government, like us, does not think that sharing is recommended...The Sunar want to use the forest for fodder and fuelwood, not to protect it for future generations." The final decision lies with the D.F.O., and the committee feels that the D.F.O. have already sided with them.

Thakuri Ban owner users told the D.F.O. that the lower castes want a share and explained why they, the Thakuri, do not want to give it to them. The D.F.O. said that Thakuri Ban owner users can continue protecting the forest without sharing with anyone. The owner users feel that this is an official policy or rule and it gives them a sense of security and right. The D.F.O is constantly approached by both sides in the dispute; in response they tell each group what they hope will satisfy them, without taking any actions to ensure that the needs of either side are met. Because the Sunar and the Thakuri refuse to approach the D.F.O. together, the dispute remains at a stalemate.

If we look at the facts, the Sunar are not deprived of a livelihood because of their status as access users. Access users pay a tax to the D.F.O. to cut timber (green wood) from the Thakuri Ban forest areas; owner users must also pay a royalty. Access users do not pay **pathi** to the watchman or have the burden of protecting the forest. In essence, occupational caste households are deprived of only 5 **bhari** of **mauha** a year. But this issue goes much deeper than the facts. The Sunar feel dispossessed, excluded, restricted. They feel that as they have been in the village for as long as the higher castes and, because they use the forest as much as official **bijan** holders, they should have a say in the management of the resources and a share in the allocation of those resources. This is not really an issue of access to the forest, it is an issue of access to power.

Power stems from caste and socio-economic status, but it is also linked to gender. While the most obvious conflicts are between castes and groups of users, there is also conflict between the institutions which govern resource access and use, and the people who must access and use the resources. And this conflict, although not rooted in gender, is often played out as a gender conflict.

Village politics occur in the male sphere: it is men alone who go to the D.F.O.; men alone who attend committee meetings to discuss forest-related problems; and men alone who will, ultimately and unfortunately, decide the outcome of forest conflicts. But it is the women and children who are the most affected by disputes concerning forest products, who fear being caught cutting illegally, who feel most directly the effects of dwindling resources.

An encounter between the forest committee chairman and a group of women in the forest illustrates the division between the two spheres of involvement - male and female - in forest problems. The chairman and the forest watchman walked up the hill to a large tree where some young Sunar women were resting in the shade. The chairman (probably for my benefit, as much as out of anger), began a tirade against the occupational castes and their destructive cutting practices. The following is a translation of what he said to the women:

> You can't cut everything you want from the forest. You can't cut green tree branches. The watchman said that you have been cutting green tree branches and then hiding them for tomorrow. We are trying to give you your own forest, but when we call your fathers and brothers to the meetings they do not come.

The chairman then walked off with the watchman to search for evidence of recently cut green trees and hidden green fuelwood. He called back to the group under the tree, saying that if he found hidden green branches, they would be "in big trouble." The women said that he would probably fine them Rs.50, destroy their baskets, and then confiscate their sickles. When I asked the chairman why he scolded the girls, he replied it was because they cut green wood. He added with a shrug, "Naturally, they must cut green wood because there is not enough dry wood."

After both men were out of earshot, a discussion about the chairman's speech ensued. I enquired as to what was meant by "We are trying to give you your own forest..." The women just laughed and one of the older women proclaimed that the chairman's words were "**jutho kura**" - lies. "He speaks for your ears, not ours," she added.

Later that day when a Sunar girl tried to tell her father about the chairman's speech he seemed unconcerned, but her mother took an instant interest. Lakshmi, the mother, said that no one had asked the Sunar to a meeting. She said that the Sunar men wanted a meeting, but the Thakuri refused to attend. Triangulation on this point revealed that indeed it is the Sunar who are pressing for a ward-wide meeting to discuss forest access and management. I inquired why the Sunar did not want the nursery, and Lakshmi replied that the chairman's words were meant for the ears of outsiders and not for the Sunar. She said that if the nursery were given to the Sunar - even though it is small - the Sunar would care for it. "But," she added, "the Thakuri will not give it to us."

What Sunar women really desire is for the government to officially take over Thakuri Ban. If this were to happen - they believe - all villagers could have equal access. Would the Sunar change their collection practices if the forest were their own? "Yes," they replied, "right now we must cut green wood and steal it. If we are given a share we will look after it and not cut green wood."

A village dialogue (**gaun sallah**) was held regarding forest management and access to resources. A number of women attended but none spoke up. A Sunar leader claimed that since the forest land is not registered, the Thakuri cannot say that it is their own, even though they have been looking after it since the Mukhiya period. The official users did not register their land after BS 1990 (1933 AD), so if shares are to be given out the Sunar should get a share. The Sunar man stated that they want "live jungle", not plantation. "It has to be done this way."

A committee meeting was convened to discuss the issues that were raised at the village dialogue. No women attended and nothing was resolved. The Thakuri merely concluded that although they have not registered the forest after BS 1990 (1933 AD), they have payed royalties (to the government) up until BS 2035 (1978 AD). This, they feel, along with the other arguments presented above, gives them the authority to deny the occupational caste users full rights within Thakuri Ban.

There appears to be a parallel here between men's attitude towards women and the higher caste's attitude toward the occupational castes. Men know that women are the primary users of the forest and that they possess much knowledge about species and their characteristics. But they refuse to believe that women are capable of making any wise decisions about forest management. The male perception is that women are both users of the forest and destroyers of the forest.

This same perception prevails when high caste villagers, men in particular, deal with the occupational castes. The higher castes hold tight to their stereotype of all occupational caste members as "destroyers" of the forest, villagers who steal green wood at night and cut haphazardly when there is no one to watch over them. In general, high caste men have a patronizing attitude when it comes both to women and the occupational castes. Both groups need to be supervised, because left to their own devices they will chop the entire forest down.

Several statements made by higher caste men illustrate this prevailing belief: "If the lower castes did take the plantation, they would not use it, they would just chop it down"; "if the low castes - Sunar and Damai - get the forest there will be increased erosion and another major landslide"; "if the lower castes continue to cut green wood, the forest will not last long". The men on the forest committee claim that owner users do not cut green wood illegally (which is not true), and that the Sunar take much green wood from the forest illegally. They reason that the Sunar are not entitled to more wood, and would not abide by the rules of the committee even if they were made formal **bijan** holders.

Although both the higher castes and the occupational castes have the same goal in mind - correct forest management and use to ensure a supply of wood which will meet each household's needs - the existing local institutions in Thakuri Gaun are inadvertently encouraging practices that do not favour sustainability. "If factionalism prevails, some groups may...exploit local resources to their short-run advantage and others' loss. Institutions that regulate resource use may break down and limits of regeneration may be exceeded when people do not understand these limits or feel they have no alternative" (Uphoff 1992:3).

Conflicts within Thakuri Gaun are deleterious to sustainability because they encourage factionalism and competition for resources. Sunar women feel that the resources are not their own and they are afraid of being scolded by the watchman for just being in Thakuri Ban. As a result, they often cut quickly and with little care. Thakuri women also experience the pressure of reduced resources and feel that they, too, must cut green wood illegally in order to meet their fuelwood needs. Neither group has the security that is essential for beneficial forest management and use. The Forest Department must begin to take an active, but sensitive, role in working with the villagers to resolve these conflicts.

Community forestry should be concerned with equity. Apart from a moral commitment, there is a practical reason also. Unless the people who collect and use forest products benefit from management arrangements established through community forestry programs, the silvicultural rules contained in management plans will probably be ignored (Messerschmidt 1991). Data from Thakuri Gaun fully support this assertion. Unless there is a fairly broad base for decision making it is unlikely that the interests of all groups will be represented. Ensuring that the legitimate interests of disadvantaged groups are met and that their needs are provided for requires active attempts to include these groups in the decision making process.

In conclusion, perhaps the most fundamental barrier to true community forestry in Nepal is institutionalized caste prejudice which reinforces class differences. In Nepal, class has been shaped historically and has its roots in the caste system. Seeley (1989c) writes that "caste" may be related to "class", because of differential access to resources which reinforces inequalities. Bell and Delobel (1987, cited in Seeley 1989c) found that landholdings among the occupational castes were smaller and of inferior quality to those of the Gurung in the village they studied.

Caste and class are virtually synonymous in Thakuri Gaun. The occupational caste villagers are typically landless, cattle-poor families who have fewer sources of regular outside income and must do occasional labour for the wealthier families in the village in order to survive. They are "lower class" as well as "lower caste". The wealthiest group in the village consists of the high castes and ethnic groups: Thakuri, Thapa Magar, Newar, and Gurung. While there are exceptions to this general rule, a socio-economic survey revealed of 15 caste/ethnic group households surveyed, 14 have a regular source of income, 12 have **khet** land, and 11 have two or more head of livestock. On the other hand, of the 10 occupational caste households surveyed, 6 have a source of outside income (3 of these 6 households have irregular income), only 2 have some **khet** land, and just 3 have two or more head of livestock.

Based on my fieldwork in Lahchowk, I suggest that where inequality is most evidenced is not between the genders, but between the upper class and the lower class. While gender prescribed roles mean that fuel is a woman's responsibility, class realities mean that women have differential access to fuel resources. Class divisions between women result in differential access to new fuel resources. Access and use, writes Nesmith (1991), are determined by both resource ownership and social relations within the village, both of which are mediated by class.

The traditional caste system in Nepal provides a justification for excluding occupational caste villagers from the forest, but the fact is that it is the poorest people who are excluded by the wealthiest. The inequity of this situation is exacerbated because the poor have few sources of fuel other than the forest. The next section explores fuelwood alternatives utilized by villagers, and discusses fuelwood conservation practices and beliefs.

6. Conservation Practices and Beliefs

Amatya (1991) writes that in the absence of a conservation-oriented education system the people of Nepal have always believed that God has given them natural resources which will continue to be provided forever. Owing to this thinking, Amatya reasons, the people do not have conservation awareness, which is also responsible for the loss of large portions of natural resources. Amatya continues that, although conservation education has been introduced in recent years, a majority of the people are still not familiar with the concept of conservation and have no alternatives for fuelwood, fodder and green manure, the trend of forest depletion is likely to continue for some time.

While some of the above strikes me as accurate - Nepali villagers do possess a sense of fatalism when it comes to the future and do have very few alternatives for tree products - the generalization that "people do not have conservation awareness" is highly questionable in light of my findings. I hope to challenge this predominant assumption through the presentation of contrary data from Thakuri Gaun.

One of the main contributing factors to the demise of the natural forest is the population increase and resulting increased pressure on natural forest energy resources. Nepali villagers are clearly aware of this problem and take active measures to conserve their resources. Three generations of Thakuri women spoke of forest depletion, and the future of the forest:

> There used to be many shrubs in Thakuri Ban. We did not need to go to the Lekh because there were enough medium-sized trees and shrubs to meet our fuelwood needs. We protected the young forest and now the trees are big. We should be receiving benefits but the lower castes are slowly destroying all we have built up...I spend all my day in the forest now...We have raised those trees like our children...We will die but it will remain for our sons and daughters.

In some cases, resource conservation is organized by communities or groups within a community. Such efforts, as have been described for the Thakuri Ban area, involve protective measures. Other conservation measures are practiced on an individual or household level. The villagers of Thakuri Gaun have a limited, but creative, repertoire of fuel utilization techniques which are aimed at the conservation of wood resources at the household level.

Household fuelwood demand is influenced by such factors as income and price of wood (determined by time taken to collect a **bhari** load of fuelwood), as well as fixed demand factors such as family size and number of livestock. Fuelwood is mainly used for cooking two large meals of **dal bhat tarkari** (rice, lentils and vegetable) and one smaller early afternoon meal (**khaja**) per day. Households that own livestock cook mash (**kundo**) with fuelwood, and others brew grain alcohol (**raksi**) for home consumption. In addition, fuelwood is used several times a day to make tea.

Villagers for the most part cook on three-legged metal stand stoves (**odan**) over an open fire in a shallow pit. Other types of stove which are also used are **boos chulo** - stoves which burn millet dust (**nal**), rice dust (**paral**), and sawdust (**boos**) - and traditional stoves (**chulo**), which are more like ovens and are constructed out of stones and red mud. Traditional mud stoves require less fuelwood but are fairly labour intensive to build and maintain. Only two households in Thakuri Gaun use these traditional stoves.

The availability of fuelwood has been steadily decreasing and, concomitantly, the price of fuelwood increasing. Nepali villagers who are financially able are more and more turning to other types of fuel such as kerosene and sawdust. Kumar and Hotchkiss state that "[F]or kerosene...there is a fairly steady increase in use with income growth" (1988:29). But sawdust and kerosene, too, are increasing in price.

Some wealthier villagers burn rice dust and millet dust; both are economical alternatives to buying either fuelwood or sawdust. Although sawdust burns better than rice and millet dust because it lasts longer, the advantage of rice dust and millet dust is that they can be obtained from a villager's own crops.

One **bhari** of fuelwood costs Rs.40-50 (about one dollar) and will last, on the average, 2-5 days. Rice dust can be bought from the Lahchowk rice mill and sawdust from Hyangja sawmill, about one hour's walk away. A **bhari** of rice dust costs Rs.40 and a **bhari** of sawdust Rs.30-40. The Thakuri owners of a small store in the village estimated that they can buy enough sawdust from the mill to last them almost a month for a mere Rs.50.

The conservation beliefs and strategies of the higher castes and the occupational castes differ markedly, although the variation between households is greater than between castes. Thakuri, because they have greater financial options, more land, and fewer household members, have a wider range of conservation options. Unanimously, Thakuri women stated that in order to conserve wood efficiently they need a sawdust stove or an improved stove[27]. Sawdust stoves were the overall preference because they require little wood, and sawdust is relatively inexpensive. The women pack the stove with sawdust, leaving just enough room to insert a medium sized stick of wood into the stove. A stove packed in this way should burn for 1-2 days before it needs to be re-stuffed. Several high caste households use both a sawdust stove and a regular **odan**. They use the sawdust stove during the warmer months when agricultural labour is high, wood is difficult to come by, and the house does not require heating. During the agriculturally slack winter months, when women are able to go to the forest daily and wood heat is required, women cook over the open fire using an **odan**.

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[27] Improved **chulo** schemes, run primarily by NGOs, have introduced stoves which burn wood more efficiently. There are a number of disadvantages to these stoves, however. Firstly - and most importantly for Lahchowk villagers - construction and maintenance of improved **chulo** require a special type of red mud, available throughout the terai and middle hills, but not available close to Lahchowk village. The nearest red mud is one day's walk from the village and villagers state that the upkeep of these stoves would be too labour intensive to make them economical. Secondly, in the winter and on colder mornings and evenings, Nepalis gather around the fire to keep warm; this is an important social time as well. The improved stoves reduce the amount of heat generated to the room and do not provide an 'atmosphere' conducive to socializing. Thirdly, the new **chulo** are designed to burn all day (they are difficult to relight and produce much smoke every time they are relit), with a back burner that keeps water hot for tea. This design

Women from landed households take full advantage of crop residues as a fuel source. Thakuri and Gurung women mix wood with maize stalks, husks and cobs, explaining that because maize residues (**mukai ko dhor**) do not retain heat, mixing them with fuelwood helps them to burn slower and keep heat. Maize residues help to cook rice faster, but they produce much flying ash. High caste women burn maize stalks and husks during Mangsir when they are up in the high Lekh collecting wood: "Mangsir-Phalgun we use residues, and Phalgun-Saun we use residues to supplement. We try to only use daura when it is rainy season or when we have much work in the fields and are unable to go to the forest."

Occupational caste women, because they have little land, do not burn agricultural residues and must, therefore, go to the forest more often to meet fuelwood needs. On average,

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is ideal for tea houses and trekking lodges, which need to keep the fire going and the tea hot all day, but is impractical for a regular household. Both practically and culturally, although these stoves burn less wood overall, they are inappropriate for the average villager. This conclusion was born out when I invited a Peace Corps volunteer to come to Thakuri Gaun to talk to the villagers about training them in construction and use of improved **chulo**. The villagers listened carefully, but eventually declined the offer for the above reasons.

women collect 16 **bhari** of green wood, 18 **bhari** of dry wood, and 2 **bhari** of **nigaalo** (bamboo) - 36 **bhari** total - every year from the Lekh. A family of 5-6 members requires approximately 60 **bhari** of wood a year to meet all of its needs, so the remaining 24 or so **bhari** of wood must be obtained from communal forest. A Damai woman stated that because she does not have any crop residues she has "no option to conserve wood." She and her small daughter are the only two household members who collect wood for their household of 7 people and 1 buffalo. It is obvious that availability of labour and land-use pattern have a direct impact on fuel use and fuel conservation strategies.

Mixing types of fuel and species of fuelwood is a main strategy employed by almost all of the women with whom I talked. Knowledge regarding which mixes of species burn best together is fairly uniform, and all women reported that it is better to mix species together than to burn just one species. Undesirable species are mixed with preferred species, because "even mahua burns well when mixed with katus and chilaune!" Fodder tree species are mixed in with preferred fuelwood species also. Both verbal data from informants and my own observations confirm that a fire with only one species of tree burns much more quickly and less efficiently than a mixed species fire.

Women of all castes reported that **katus**, **chilaune**, and **jingano** burn very well together. Other commonly mentioned combinations are **katus**, **dhairo** and **muni**, and **bilowne**, **mauha** and **phultise**. Bamboo is used as kindling (**sita**) to start the fire quickly and cook quickly. Bamboo retains heat and women commonly mix a few sticks of it in the fire with other fuelwood to help the fire burn. Many villagers burn bamboo and crop residues only when they absolutely have to, because these products do not produce coal which they need to give to the Kami and Sunar who make all of their household and agricultural implements.

Bark, leaves and, less commonly, dung are also used to "pad out" the fire when women are unable to collect enough fuelwood from the forest. In addition, roots are increasingly being burned to supplement other fuels. Several of the older women reported that they must dig roots to use as fuelwood if they do not find enough wood or do not have time to go far into the forest. Roots, however, are hard to dry out and are very smoky.

Different sizes, as well as types, of fuel are mixed to produce a better flame and longer lasting fire. A Damai woman told me that she can make one **bhari** of fuelwood last 4-6 days for 9 people. This was inconsistent with previous estimates, so I asked her how she made the wood last so long. She replied that she uses big and small pieces of fuelwood together and that this makes the wood last longer. Women mix small and large pieces together to improve the quality of the fire, and to conserve the larger, heavier sticks. Heavier wood from the Lekh is mixed with lighter and smaller fuelwood from Thakuri Ban and Poudyal Ban. Larger pieces of wood are occasionally chopped into smaller pieces to increase their burning ability. Green wood is also mixed with dry wood in the fire. Informants stated that half-dried wood can be mixed with dry fuelwood to make a good fire.

Women also collect wood in a manner that conserves the forest. Although statements concerning cutting usually expressed ideal behaviour, they reveal both knowledge of correct extraction techniques and a desire to practice them. Villagers have a deep understanding of the links between population increase, forest degradation, and the need to protect forest resources. Women often stated that when they were young they cut anything from the forest because there was a lot of wood. Now, however, they stress protection: "We cut in a protective way, even in the Lekh, because we are thinking of the future. We cut only branches, leaving the main stem."

One of the older Magar women told me that they cut leaning branches that could interfere with tree growth, rather than healthy straight ones: "Our cutting practices ensure that there will be fresh growth and that more leaves will grow back next time." Management for conservation and protection is a priority second only to daily survival for most women, because conservation means survival for future generations.

I asked the question, "What would you do if there was no more firewood?" Many of my informants could not comprehend this future scenario, but they did understand what I wanted to know: if worse came to worse, how could they really conserve wood? Many of the wealthier villagers said that they would switch entirely to a kerosene stove or sawdust stove, and suffer the cold in the winter and try to manage financially. Other informants described drastic measures to cut back, such as not cooking livestock food and eating half-cooked rice. These measures are not unrealistic in terms of the current depletion of resources; several of the poorest households in Thakuri Gaun admitted eating half-cooked rice regularly in order to conserve wood.

What this question and all of the data collected on conservation beliefs and practices suggest is that village women believe that they are doing all they can to conserve wood. They feel that other viable options for conservation do not exist given the position that they are in now. Despite their powerlessness to change the situation, it must be stressed that women have developed a system of indigenous knowledge concerning conservation which involves both economy and ecology. This system has been developed out of necessity, and is deeply affected by both their beliefs concerning the importance of resource conservation, and their beliefs concerning their own ability to affect changes in consumption of fuelwood.

The discussion of conservation options and practices also suggests that socio-economic constraints felt by occupational caste villagers have a deleterious effect on the forest. The poorer people in Thakuri Gaun are often unable to take advantage of external technologies and information which could be potentially beneficial, partly because of socio-economic constraints such as inequities in access to resources. Occupational caste households have very little cash, and, therefore, depend almost exclusively on forest resources for meeting their fuelwood and fodder needs.

While Balla et al. (1991) report that some low and mid-low income households use sawdust stoves, this is not the case in Thakuri Gaun. As we have seen, higher caste households, who usually have larger incomes than occupational caste households, depend more on alternative sources of fuels. Many high caste families burn residues from their own fields, use sawdust stoves, purchase kerosene, or buy their fuelwood from others rather than go to the forest to collect firewood. For occupational caste families, on the other hand - who have a cash shortage but not a labour shortage - alternative fuel sources to firewood do not make economic sense.

This chapter suggests that management does not occur in a cultural vacuum, and because it does not occur in isolation conflicts arise. Individuals belong to households, caste groups, and user groups; the work that they do is influenced by age, gender, caste and socio-economics. Individuals are members of a community, and the community part of an even larger system. Thus management includes a combination of individual practices, household strategies, external linkages, cultural ideas, and social mechanisms rather than any one of them in isolation (see Fricke 1986). Concomitantly, just as these management strategies cannot be studied in spatial isolation, so they cannot be studied in historic isolation. Acharya (1990) writes that management is an ongoing process, so that what people do currently is shaped by their previous experiences, future expectations, and present circumstances.

Because society and culture are the context within which indigenous forest management exists, the documentation of indigenous knowledge for even one group could constitute a lifetime of effort. Yet the study of local culture is essential to an understanding of the relationships between people and between people and their natural environment. Inherent in any culture are both the conflicts which constrain local potential, and the potential itself. The introduction of outside technology or the replacement of the local system by a modern one is not the solution to local conflicts and constraints. Systems in distress, as many resource systems are in Nepal, require strengthening and reworking. The indigenous knowledge of resource users and managers is the key to this transformation.

CHAPTER V

INDIGENOUS KNOWLEDGE IN THAKURI GAUN

I have discussed both the formal and informal elements of the local management system of Thakuri Ban, and addressed the responses of the villagers in the face of these conflicts and constraints. This chapter will attempt to paint a picture of the wealth of indigenous knowledge that villagers, mainly women, possess, through the presentation and analysis of the main body of data that I collected in Thakuri Gaun.

I first address the question "How viable is indigenous knowledge today considering its inherent limitations, modernization, and external and internal stress factors?" The remainder of the chapter presents data collected in Thakuri Gaun, discussing who the forest knowledge holders are, what type of knowledge they possess, and why.

1. The viability of indigenous knowledge

Researchers must be careful not to blindly promote the resurrection or wholescale adoption of indigenous knowledge systems into policy and legislation. Without modification and improvement, indigenous knowledge can become dysfunctional due to a host of different pressures. "It is, therefore, important to understand the dynamics of the system" (Titilola 1990:17). The process of integrating indigenous knowledge into project design and implementation is often fraught with difficulty. ITK-centred "...interactions are set within, and their characteristics are affected by, a much wider structure of social, economic and power relationships" (Bell 1979:45). These relationships, and a number of other factors, can constrain both the development of local knowledge, and the utilization of this knowledge in development efforts.

Indigenous forest knowledge systems have changed due to the effects of both internal and external forces and pressures. Constraints to the continuity and development of local knowledge can stem from a number of areas. Some of the most difficult constraints to overcome are cultural, socio-economic, and environmental. For example, an important cultural constraint to the development of indigenous forest knowledge (IFK) is the negative value often placed on forest resource knowledge by Nepali villagers. The groups that work most closely with forest products, and therefore possess more knowledge in this area, are women and the occupational castes. Because these groups are at the lowest rungs of the social hierarchy, there is very little appreciation of their knowledge. The acquisition and utilization of this knowledge is often not encouraged, children turn away from traditional caste-bound occupations to pursue wage labour, and knowledge is lost.

Since forest resource use is very labour intensive, the availability of labour at the household level in part defines the viability of IFK. "If labour is available, these systems persist, if not, then people find...[alternatives] which often result in a breakdown or modification of the system" (Niamir 1988:9). Labour availability has generally decreased as children are being sent to school, and young men leave for wage labour and other occupations.

Other important socio-economic constraints to the development of local knowledge are the rise of the cash-economy and the move towards alternative fuels among the wealthier high caste villagers, increased access to formal education, and the outmigration of men from the village. The introduction of outside materials, such as modern medicine, "improved" stoves which use kerosene or sawdust, and improved building materials are reducing the need for natural resources among the wealthier families, and thus reducing IFK.

Socio-economic changes have a great impact on indigenous knowledge systems in many parts of the world. Rocheleau (1991) reports that in Kenya some members of the community attributed the persistent decline in indigenous knowledge to formal schooling and male outmigration. Perhaps more important, men's outmigration had simultaneously removed adult men as tutors and created a labour shortage and double workload for women, leaving little time for traditional education in multi-generational groups of either sex.

Fewer female children than male children are educated formally in Nepal. Both the researcher's own data and the findings of Acharya (1981) suggest that it is neither the cost of education nor the conservatism of the parents that is the primary cause of the significantly lower percentage of female enrolment encountered. Rather it is the family's dependence on a girl's labour at home and in the fields that is the primary reason given for keeping girls out of school. But this pattern is changing, as a comment by an old village women indicates: "Old women like me who still go to the forest know more than the young girls. Because girls go to school these days they do not know what to cut and what not to cut and what places are good. Young kids cut and collect everything." Moreover, women have different rights and responsibilities than in the past and have had to acquire and maintain an even broader range of new knowledge and skill.

Niamir gives an illustration from Africa which, to a startling degree, parallels the situation in Nepal. She writes that nationalization of land has perhaps been the single most damaging factor to traditional social controls on natural resources. "In one stroke the government denied the local people exclusive access to their traditional commons, and eliminated any local responsibility for its maintenance. At the same time, most governments lack the resources to maintain the rapidly degrading commons" (1988:6). Niamir continues, explaining that nationalization of land and the abrogation of tribal territorial rights has also contributed to both socio-political fragmentation and increasing claims by non-traditional users. Manandhar describes similar results stemming from the nationalization of forests in Nepal:

> ...the National Act...hastened the process of forest depletion, especially in the hills and mountains where previously traditional forest management allowed many rural people to satisfy their basic forestry related needs without overly depleting the resource base, the new act made such arrangements illegal. As long as enforcement was lacking the people tended to overexploit forest resources which they no longer felt were their own (1982:8).

Environmental degradation and collapse can throw local systems into disequilibrium. Over hundreds of years many Nepali communities developed formal management systems; these systems defined specific users' rights to valuable products from trees growing on common lands (Mathias-Mundy et al. 1990). Increased deforestation either resulted in the breakdown of these systems, or the development of new systems. "It is important to stress that indigenous systems of forest management are not remnants of old systems. They are dynamic responses to changing situations" (Messerschmidt 1991:49).

Internal and external pressures lead to adaptation, which is why it is vital that local knowledge systems be studied as living processes, within an active environment of social interaction, production, and consumption. Yet, as Bebbington (1991) points out, most research and writings on indigenous knowledge are weak in analyzing the role of this knowledge in cultural change, or the socio-economic and political forces that influence and alter this knowledge.

The survivability of indigenous knowledge depends upon its usefulness within the culture. People adapt to changes in their physical and cultural environments and indigenous knowledge must be fluid in order to keep pace with changing circumstances and demands. Atte writes that "[G]roup culture...[is] the repository of knowledge gained and of problem solving processes acquired, and passed down generations through the cultural learning process" (1989:5).

Direct interaction with the environment from childhood enables rural people to acquire a detailed stock of primary knowledge - locational and attributive - about that environment (Atte 1989). If certain knowledge is no longer necessary for successful interaction with the environment, it is unlikely that information in that domain will be communicated. For indigenous knowledge to remain viable, it must be shared, communicated between individuals and generations.

Opportunity to learn about the environment is afforded through observation, participation, and direct formal education by parents, older siblings, and other members of the community. Information about historical, cultural and physical environments is incorporated into a variety of mental exercises - activities, which are themselves structured by social life. "Rural group representation of cognitive regularities" (Atte 1989:5) concerning the environment are encoded into proverbs, stories, songs etc. which form a repository of group knowledge.

"Understanding an indigenous knowledge system involves being cognizant of differences in who knows what, but it is important to also think about how knowledge is organized, for what purpose, and how the knowledge is passed on from one person to another, from one generation to the next" (Norem et al. 1988:13). Very little has been written on how ITK is passed down through the generations. In general, young children start to learn about their physical environment as soon as they learn to play games with wood, sticks, and leaves. As soon as they are old enough, they start a long process of "apprenticeship," or learning by doing, under the guidance of older family members. According to Niamir (1988), traditional education has three characteristics: 1.) it is completely effective, i.e. the child learns all he/she needs to know to become a functioning and productive adult; 2.) the cost of education is not prohibitive; and 3.) children are not totally withdrawn from the work force.

Mundy and Compton (1991) discuss the two main types of indigenous oral communication: intergenerational and lateral. Intergenerational communication involves the passing down of knowledge from father to son, mother to daughter, and teacher to pupil. Lateral communication is the spread of information among peers and from place to place. Forest knowledge in Nepal is imparted, mainly to girls, through informal oral education. Young girls learn about the forest through both intergenerational and lateral communication. One villager commented that women are taught by their mothers what trees are good for fuelwood, and what species to cut and not to cut: "We don't learn from our mother's womb; we learn when we come out." As she grew up she learned about the rules of the protected forest from friends and neighbours.

The strength of rural people's knowledge is that it is based not only upon acute observation, but also on experimental learning (Altieri 1988). The experimental approach is very apparent during the learning process of Nepali children gathering fuelwood and fodder. If the wood burns well and is fairly "smokeless" and the fodder increases animal health and milk production, the children will gather those species again. Several women commented that they learned which fuelwood burns well through observing how fast the food cooked and how well it tasted when using different species of wood. An old woman added that, "when the younger women bring daura, no matter how much they bring, the older women tell them that it is not enough. What burns well and what the cattle eat, they bring again." Women learn by trial and error. The teaching pattern seems to be instructional when the girl is very young, and then experimental when the girl is older and no longer under the direct supervision of older females.

Indigenous knowledge is acquired, retained, added to and transmitted through both oral education and practical participation in environmental management. It plays a most important part in local culture and forest conservation. What people know about trees and forests - about their products, uses, benefits, and the ecological interrelatedness of species - is fundamental knowledge.

In our contemporary concern for sustaining the biological diversity of the world's forests, it is just as important to understand what people know and how people use species as it is to preserve and protect the species themselves (Messerschmidt 1991, Subedi et al. 1991). And for the purpose of gathering indigenous knowledge data and understanding how indigenous knowledge systems function, it is equally important to be aware of who knows as it is to understand what they know.

2. Indigenous forest knowledge holders

Indigenous knowledge is not distributed evenly among the members of a society. Individual knowledge can vary greatly; not every member of a culture is necessarily an expert in ethnobotany (Castro 1990). Some people engage in activities such as collecting firewood, construction, herding, healing, and so on, that bring them into more frequent contact with forest resources. Sometimes particular types of knowledge are the preserve of "caste-like" groups. Within communities there are also specialists who are the repository of specialized knowledge (Chambers and Howes 1980, Niamir 1988). In addition, there are usually individuals who have a greater aptitude for, or different interest in, topics such as the uses of trees and plants. Systematic variations in knowledge, however, are usually due to gender, age, economic and social class, and a number of other factors.

Norem et al. (1988) suggest several ways to think about gender differences in knowledge systems. These ways of thinking can also be expanded beyond gender, to take into account caste, age and socio-economic variables. The first way to think about variation of knowledge is by exploring differences in knowledge of similar things. For example, men are primarily responsible for the health of cattle, while women are more concerned with the health of their families. Certain herbs have curative properties for both cattle and people; but men will be cognizant of only the herb's ability as a cattle remedy, and women will state that the medicinal plant is used only for people. Research in Lahchowk indicates that men seem to know much more about land measurements and the monetary aspects of forest management and forest products, whereas women know more about the biological aspects of forest products and management.

Seeley (1989c) reports that during a maize survey conducted in Nepal the most fruitful interviews were those in which a number of household members participated. Women and men tended to have precise knowledge on different areas of maize cultivation and processing. "Indeed one woman interviewed with her thirteen year old son laughed as he corrected her figures on landholding, but she knew the details of the amount of seed sown, and the growing and processing properties of the different varieties" (1989b:13).

One last example illustrates gender difference in knowledge of similar things. Nepali villagers rethatch the roofs of their houses every Phalgun to prevent leakage. Men and women both collect thatch grass (**khar**) from fields known as **khar bari**, and wheat residue (**nal**) from **bari** land. The women then select what type and length of thatch should be laid first and last, and what should be laid in the middle portion. They then hand sections of thatch up to the men who lay and secure the thatch. Both men and women know how to cut thatch; women know how to select and mix different types of thatch for different portions of the roof; and men know how to lay the thatch so that it is secure and will prevent leaks.

Different castes also have different knowledge about similar things. While the Thakuri may be aware that a certain species of firewood is "smokeless" or fast burning, they will be unaware that the residual coal of this species is excellent for goldsmithing. This knowledge would be the possession of the Sunar caste who are the village goldsmiths. In addition, two castes may have two different names or uses for the same species of plant. They may or may not be aware of the other names or uses.

The second way to look at knowledge variation, according to Norem et al. (1988), explores specialized knowledge in different domains. The statement suggests that men and women may have knowledge about different things. Gender-based divisions of labour and socio-economic differences between castes result in the possession of different types, categories, or domains of knowledge by different groups. Because only men work extensively with **nigaalo** and **baans** (bamboo species), they are the knowledge holders in this domain. Women are largely unaware of the details of propagation of these species. On the other hand, most men do not know which wood is the lightest, the heaviest, the quickest or slowest burning, the hardest or easiest to find. Knowledge of fodder trees and their properties is possessed only by those people who own cattle; the poorest villagers, who generally have no cattle, lack detailed knowledge of this type.

Although Norem et al. (1988) fail to mention group knowledge - knowledge common to men and women of all age and social groups - such knowledge does exist. For example, while in the forest a Thakuri man pointed out a green plant which he said disturbs other plants, both trees and shrubs. Everyone who uses Thakuri Ban (and also Poudyal Ban) cuts this shrub for fuelwood because it is one of the few species that women from all castes can cut green all year round. This is generalized IFK, and an indirect management technique which keeps the forest healthy.

Lastly, different groups of people may have different ways of organizing knowledge. It is very important for researchers not to impose their own categories on the knowledge of the people with whom they are working. Different groups of people have different ways of looking at the world and organizing their understanding of the environment. ITK is often coded and evaluated in an indigenous framework, or it may simply be embodied in models of correct practice based on the cumulative successful results of prior experimentation under specific conditions.

This knowledge provides two types of information for outside researchers: 1.) the coded or otherwise explicit systems of indigenous science which explain the interaction of plants, humans, and environment and management in the system, and 2.) the system itself, which can be sampled, monitored and manipulated in situ (Rocheleau 1987a). Rusten and Gold write that "[A]n important element of indigenous knowledge research involves understanding how members of the local population categorize, classify and label perceptions of their social and biological environments, and how different forms of indigenous knowledge flow through a social system" (cited in Speth 1990:11).

Need and the uses to which species are put differ between individuals and groups and affect how items are categorized. For example, occupational caste families with high fuelwood demand classify citrus trees primarily as fuelwood species, and only secondarily as fruit bearing species. High caste villagers with larger cash resources and less demand for fuelwood stated that citrus species are utilized primarily for their fruit, and only secondarily for fuelwood and fodder.

Although gender and caste/ethnic group appear to be the variables which have the most direct and profound effect on amount and type of forest knowledge possessed by individuals, other factors, which stem from caste, also have an influence on forest knowledge. One of the outward characteristics of caste affiliation is settlement pattern. Travellers and scholars in Nepal have long noted settlement variations between different ethnic groups and caste groups. My research in Thakuri Gaun indicates that settlement pattern may also influence IFK.

The occupational castes live clustered together with only small home gardens separating one neighbour from another. This facilitates larger groups of women going to the forest together and increases communication and the sharing of knowledge between caste members. This is especially true with the Sunar, who live in a close settlement and have much caste solidarity. Higher caste homes are further apart, separated by fields. Neighbours seem to come together to chat less frequently than among occupational caste villagers; family groups are more isolated and small groups of related women go together on fuel-gathering expeditions.

Similarly, household composition and residential pattern also seem to play a role in shaping knowledge. Chayanov's (1966) work on Russian farmers illustrates how agricultural decisions will be influenced by the composition of the household at the time when the decision must be made. A household will weigh its needs against the labour required to fill them. Barlett (1980), using data from Costa Rica, shows how the age of the eldest male in the household influences the decision to take up a new technology. It stands to reason that if decision-making is influenced by factors such as age, the number of teenage children, or the absence of a key adult, these factors will also affect the acquisition and communication of indigenous knowledge.

Family size does seem to have an influence on IFK in Thakuri Gaun. This relates to Castro's (1990) thesis that the degree of dependence on local resources for items of material culture also appears to affect the extent of indigenous knowledge. Occupational caste households have a greater degree of dependence on forest products, which increases the extent of their indigenous knowledge. The occupational castes in Thakuri Gaun have an average household size of 7.7, whereas the higher castes have only 5.5 members per household. A larger number of children increases a household's need for fuelwood, and also enables the household to exploit the labour of so many children in collecting these resources. Higher caste families are smaller and economically have more options; they therefore require less fuelwood for cooking and send fewer family members to the forest.

High caste children attend school rather than go to the forest. School attendance is low and sporadic among the occupational castes; even boys of the occupational castes must go to the forest to get fodder and fuelwood. They spend much more time in the forest than do their higher caste peers. My research suggests that children of the occupational castes, both boys and girls, possess much more detailed knowledge of forest products than do their counterparts in the higher castes.

Many researchers write that older community members are the repositories of cultural knowledge. While a few of my key informants were elderly villagers, the best informants were not very old and I often encountered old people who contributed very little in terms of forest knowledge. The question of why many old people, who have spent twenty to forty years going to the forest, appear to have forgotten, or lost, much of their IFK became a central one.

A story told by an anthropologist (Don Messerschmidt pers. comm.) who has worked in Nepal for many years sheds light on the question above. The story was related as follows: The anthropologist and his guide were trekking through a forest in Nepal when the anthropologist asked "Do people ever burn the forest?" "No," replied the guide. Several days later, the two passed through an area which looked, to the anthropologist, as if it had been systematically burned. Again, the anthropologist asked "Do people ever burn the forest?" "Of course they do," answered the guide, "Can't you see right over there where people have burned the forest?"

This story was told to make a point; researchers must ask the right questions at the right time in the appropriate context. But this refers not only to current context, such as "in an area of forest which has been recently burned", it refers also to life-cycle context. Very old women - and older men - no longer go to the forest. They are not responsible for forest product collection; the forest is no longer part of their context. The idea of appropriate context concerns not only the context in which the researcher and the villagers are located, or the appropriate moment in which to spring a question, it also concerns the life context of the villager.

As interview data accumulated an age pattern began to emerge which suggests that, generally, those who possess the most IFK are females between the ages of 10 and 40, and males between the ages of 10 and 25. Maximum IFK correlated with the ages of peak forest exploitation by men and women. This data was corroborated by the villagers, one old women stating that "young girls know the most about the forest because they go every day. The old people have forgotten."

Indigenous knowledge is already ordered and specialized at an early age because it is necessary for survival. In an exercise conducted with a group of occupational caste boys, the boys were asked simply to "write about fodder and daura" (see Table 1). The categories and classifications generated were purely their own. The boys divided their list of trees into smoky and smokeless fuelwood, and herbal medicines for cattle. The Sarki boys knew much about herbal medicines, while the Sunar boys had more knowledge of which fuelwoods are smoky or smokeless. Although a few of the attributes were incorrect, the number of species names generated in just a few short minutes was impressive. They listed 24 species of fuelwood and then wrote down 6 herbal remedies for cattle, how to prepare them and what they are used for. Boys, too, said that they learned about fuelwood and fodder from their mothers and older sisters.

TABLE 1 - CATEGORIZATION BY OCCUPATIONAL CASTE BOYS

Smoky species	Smokeless species	Cattle remedies
simal	sisoo	satua-grind and mix with water
ghokare	chaap	haledo-flower and root used to dry up excess stomach water
phaledo	citrus sps.	hade lasun-root is used for stomach problems
khirro	chuletro***	timur-pepper-like seed; also used in cooking
chilaune*	baans	havro-grind fruit
berulo**	nigaalo	ankhe timur
bilaune	kavro**	
neparo	pakhuri	
rudhilo		
guiali		
chuletro**		
guava		
dabdabe		
kaulo**		
utis*		
katus*		
mauha		

*although the boys placed these species in the "Smoky species" column, they are considered by all of the women I talked to be smokeless species.

**informants indicate that species is also used for fodder

***chuletro appeared in both columns, and the boys said that they were unsure as to whether it was smoky or smokeless.

It is interesting to note that all of the fuelwood species the boys listed are tree species, not shrubs. The only medicinal species which is a tree is **havro**, all the rest are shrubs. As well, the majority of the species listed are used mainly for fuelwood, and not fodder. This is in keeping with the data collected from adult informants of both occupational and high castes. The occupational castes must utilize more shrub species; therefore, their knowledge of shrubs is greater than that of higher caste villagers. Occupational caste villagers own fewer cattle, and their demand for fodder is less than villagers who own several head of cattle; knowledge of fodder species is therefore not as important and not as great. Herbal remedy knowledge on the part of the Sarki boys was to be expected; the practice of herbal treatment is highest among Sarki men in Thakuri Gaun. Lastly, the organization of knowledge is telling. Already, young Sunar boys are preoccupied with the properties - smoky and smokeless - which most concern their fathers. And Sarki boys are already concentrating on the curative and remedial properties of plants.

Species preference exercises which explored preferences based on age groups, caste groups, and gender are an excellent indicator of the criteria that people use to organize their knowledge. Castro (1990) reports that there is usually a well-defined local preference for specific species and parts of trees for specific purposes. For example, local preferences for firewood in Thakuri Gaun are based on burning properties, availability, the intended use, cultural attitudes about how the fuel affects the taste of food, and a number of other factors. Because wood fuel collection and cooking are usually gender-defined tasks, women are often the main holders of knowledge concerning fuelwood.

Women from different caste/ethnic groups prefer different species of firewood for different reasons; if the same species is preferred by women of two different caste groups, it is usually for different reasons (see Upadhyay 1991 for a discussion of this phenomenon in regard to tree fodder). A fuel that burns well and lasts longer, reducing the demand for wood, is preferred by Thakuri women. Thakuri women are not able to go to the forest every day so long-lasting fuels with heat-holding capacity, multi-purpose species, and easily available species are given preference. Lightness of the wood was also said to be important: several Thakuri women reported that light to carry fuelwood species were given preference over species that may burn better but are heavier. The reason stated was that with light wood they can carry back twice as much and, theoretically, have it last twice as long.

Sunar men and women give "quick burning" and "smokeless" fuelwood top priority, perhaps because of their occupation as goldworkers and the concomitant necessity of both producing maximum amounts of coal and ash, and working over a "low heat" fire for many hours a day. Sunar stated that all citrus trees, although not preferred by the other castes, are good for fuelwood because the wood is relatively smokeless.

Damai women mentioned "burns slowly" as the most important fuelwood attribute, along with "gives good flame" and "smokeless". Damai women, unlike Thakuri women, said that a good flame is more important than lightness of carrying. Damai women's answers suggest that, rather than selecting good fuelwood specifically, they tend to avoid a few non-preferred species. While Thakuri women named three or four preferred species, Damai women collect everything except for three or four very poor species. Castro (1990) explains that use of less desirable or inferior species is generally a key indicator of increased tree scarcity and, in the case of Thakuri Gaun access dynamics, decreased access to resources. I will return to the issue of scarcity later on in the chapter.

The three Sarki families have a large proportion of young children and infants to adult family members. This means that a few trips to the forest must produce a lot of bulk in fuelwood to meet the needs of the household. Therefore, Sarki women prefer light wood species which are easier to find and to carry back in large quantities. These lighter species - **dabdabe**, **jingano**, **gurans** - are mainly found in the Lekh. One woman's comment vividly describes how important the Lekh resources are to the Sarki: "I get only dry wood from the Lekh, but I am willing to fight the people from Gahchowk for it." The two most important attributes of fuelwood for the Sarki are "burns quickly" - which, therefore, "prepares food quickly" - and "light to carry". When asked if smoky or smokeless fuelwood was preferred, the Sarki informants replied that all fuelwood produces smoke, but that "smoky" fuelwood burns and stings the eyes, whereas "smokeless" fuelwood does not produces painful smoke.

Newari women also stated that "slow burning" fuelwood is "bad", and "fast burning," which gives a hotter flame, is "good". Gurung women, on the other hand, stated that the best fuelwoods are those that "burn slowly" and are "smokeless". The reason given for their preference is that the residue of slow burning woods turns from coal to ash. The coals, as they turn to ash, retain the heat. According to the Gurung, the faster burning species do not give as much heat.

There is no perceivable difference between women of different caste/ethnic groups in their most preferred species for firewood. This indicates that the criteria for assessing absolute quality are uniform among village women. Preference differences emerge when a fuelwood species possesses undesirable attributes in relation to individual wants and needs. Women of all castes stated that **sissoo** and **sal** pines are the best species for fuelwood, but that they are not available in the area. Of the species that are available, women almost unanimously agreed that **katus**, **jingano** and **chilaune** are the best fuelwoods, although they are the most difficult to find dry[28]. Some of the reasons for the women's preferences for **jingano, chilaune** and **katus** are that they can be stored without decay, give a hot flame, are long lasting, cook rice quickly, and are smokeless.

Below are the results of a fuelwood ranking exercise conducted with different caste groups of women which support the above statements. The aim of the exercise was to assess convergence and divergence of opinion concerning the most desirable fuelwood species.

Sunar*

1. Preferred daura trees:
    a. chaap
    b. utis
    c. ruktachandan
    d. gurans
    e. towne
2. Preferred fruit trees for daura:
    a. guiali
    b. katus
    c. ainselu
    d. kafal
    e. malo

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[28] One of the most unusual answers to the question "What fuelwoods are best and why?" was supplied by a Sarki woman. She replied that **katus** is the best because it burns fast and makes good coal for the Sunar. I asked her why this was important, since she and her family did not need the coal. Her answer was surprising: "If they think its good - if its good for them - we think its good." Throughout the research it became clear that the Sunar, the most socially and economically powerful of the occupational castes in Thakuri Gaun, are both feared and admired by the Sarki and the Damai. The other two occupational castes fear that the Sunar will provoke the higher castes, and bring anger and punishment down on them all; but they also envy the Sunar position in Thakuri Gaun, and follow their lead in village affairs and disputes. This type of reference group behaviour is like a balancing act which neither helps nor hinders the Sarki and the Damai politically, socially, or economically.

3.Preferred fodder trees for daura:
    - a.bawte
    - b.musare katus
    - c.kafal
    - d.sano jingano
    - e.phalant

*10 women participated in ranking

Sarki*

1.Preferred daura trees:
    - a.chilaune
    - b.katus
    - c.jingano
    - d.gurnas
    - e.towne

2.Preferred fruit trees for daura:
    - a.chutro
    - b.malo
    - c.machayno
    - d.ainselu
    - e.guialee
    - f.katus

3.Preferred fodder trees for daura:
    - a.kaulo
    - b.jingano
    - c.phalant
    - d.chaap
    - e.chuletro
    - f.nigaalo

*6 women participated in ranking from all three households

Damai*

1.Preferred daura trees:
    - a.jingano
    - b.utis
    - c.dabdabe
    - d.chilaune
    - e.katus

2.Preferred fruit trees for daura:
    - a.gurans
    - b.guialee
    - c.okar
    - d.katus

3. Preferred fodder trees for daura:
    a. chilaune
    b. phalant
    c. guialee
    d. katus
    e. kavro
    f. kaulo

*5 women participated in ranking

Newar*

1. Preferred daura trees:
    a. dabdabe
    b. chilaune
    c. katus
    d. mahua
    e. jingano
    f. gurans
2. Preferred fruit trees for daura:
    a. katus
    b. malo

3. Preferred fodder trees for daura:
    a. katus
    b. chilaune
    c. jingano
    d. phalant
    e. muni
    f. dhairo

*4 women participated in ranking from all three households

Thakuri*

1. Preferred daura trees:
    a. jingano
    b. katus
    c. machayno
    d. dabdabe
    e. ruktachandan
    f. utis
    g. phalant
2. Preferred fodder trees for daura:
    a. berulo
    b. pakhuri
    c. badhar
    d. simal
    e. phaledo
    f. kavro
    g. khanyu
3. Preferred fruit trees for daura:
    a. katus
    b. gurans

*15 women participated in ranking

Another exercise with village men and women was conducted to further explore the properties, seasonality and location of fuelwood species. This activity, participated in by caste/ethnic groups revealed similarities in perception of fuelwood attributes (rather than subjective value as a fuelwood) between castes, and also indicated which forest areas are exploited during which months. The informants were asked to name the fuelwood which most "fit" the qualities listed, then to tell the researcher from where, and during which seasons the fuelwood is collected. There were striking similarities between castes in certain category answers. **Katus** was named as the "quickest burning" fuelwood in 3 out of 5 cases; **katus** and/or **chilaune** were named as the fuelwoods with the "best flame" by all groups; **katus** was also given as the fuelwood which produced the least smoke by 4 out of 5 caste groups; in 3 exercises, **utis** was named the lightest wood and in 4 exercises **phalant** was described as the heaviest wood; and again, **chilaune** and **katus** were named the fuelwoods which best retain heat by all groups.

Commonalities in perception and knowledge are the result of common experience; all of the groups have knowledge of the trees in the area, and have based their opinions on observation and trial and error. It should also be noted that the Sarki and the Sunar share more of the categories in common than do any of the other caste/ethnic groups, despite that fact that they exploit different forest areas. Their frequent association in the village (see footnote, page 152), analogous exploitation patterns, and similar socio-political constraints all contribute to their common perceptions.

"Who knows what?" is an interesting but complex research question. In order to identify the categories of knowledge possessed by different groups of people, I collected data from access users, owner users, women, men, adults, children, the occupational castes, and the higher castes. A number of species identification exercises were conducted with the villagers (see Appendix C). My research assistant and I first collected a sample of species from the forest. On the suggestion of the forest guard, I collected species which were both heavily utilized and not utilized at all by villagers. I only used plants from the forest area which the groups participating in the exercise collected from regularly. I then showed the group the plant and asked them for its name, main uses, collection season, and any other important attributes. The central aim of these activities was not to look at indigenous categories, but rather simply to elicit knowledge of different forest species and identify possible differences between groups in this knowledge domain. These exercises were participated in mostly by single caste/ethnic groups of men and/or women in order to determine the presence and extent of caste and gender-based knowledge. In most cases the groups included all ages.

What the species identification exercises immediately revealed is that knowledge of different trees, shrubs, vines, flowers and fruits is high among all caste groups. Sunar, Damai and Sarki informants appear to have a broader knowledge of species, and were able to give richer descriptions of the primary uses of forest products. These groups were also more likely to describe species as being available or being collected during the whole year, rather than during specific months, as did higher caste informants. Where specific months were given for species, occupational caste informants explained that this is when fruit is ripe, or the plant flowers, etc. This again confirms that occupational caste villagers exploit the forest year-round whereas high caste villagers limit their exploitation to certain months of the year.

Depth of description was increased when occupational caste men participated in the exercise, but not when higher caste men were involved. Sunar and Sarki men especially added to and expanded on the information given by women. Thakuri men, on the other hand, were unable to provide additional detail to women's descriptions, and lacked accurate and indepth knowledge when questioned on their own.

A similar exercise was conducted which tested knowledge through non-visual recall rather than visual identification of species. The organization of this knowledge was largely controlled by the informants and the data were organized using the categories of the village women, not the researcher. The discussion was verbal but the information has been drawn up into tables presented in Appendix D.

Although firm conclusions cannot be drawn and broad generalizations made based on the data provided by only one exercise, set in the context of all of the other information collected interpretation becomes easier and clearer. Once again, the non-visual recall activity high-lighted differences in organization and categorization by different caste groups. As previously discussed, whether a fuelwood is smoky or smokeless is of prime importance to the Sunar, and of lesser importance to other caste groups. Whether a species is a shrub or a tree is also important to the Sunar, because shrubs are often cut when they are green, whereas it is prohibited, and therefore riskier, to cut trees green. The Sunar, who are forced to take green wood illegally from the forest, listed a larger number of shrubs than did any other group, and described all species recalled as either "smoky" or "smokeless".

It is interesting to compare the number of species listed by caste group. The participants were asked to name as many tree species as possible that are used primarily or regularly for fuel. Unlike the previous species identification exercise, this activity was conducted "out of context" and relied on direct recall. The results show that the Sunar women named 28 species, the Sarki women named 27 species; the Damai, 24; Newar, 12; and Thakuri, 22. There are two possible interpretations of these results, both of which support hypotheses put forward in this thesis. Firstly, one could conclude that occupational caste women, especially Sunar and Sarki, have more knowledge of the tree species in the forest areas surrounding Lahchowk village. Species identification exercises and discussion with women in the forest also support this hypothesis.

Secondly, the larger number of species listed by occupational caste women might indicate that a wider variety of tree species are utilized for fuelwood purposes. Occupational caste women feel pressure to collect everything that will burn, apart from the most undesirable species. For example, Sunar women listed 7 non-preferred fuelwood species which they use regularly. In contrast, Thakuri women named only 3 non-preferred species which are ever burned as fuel. Sarki women named species as either "good" or "average" fuelwood which Thakuri women described as "non-preferred". Higher caste women are able to practice selective behaviour, rejecting many species which are undesirable, whereas occupational caste women tend to collect everything except the very worst fuels.

Other information provided by the recall exercise concerns the forest areas from which fuelwood species are taken. This information is important in light of the previously discussed conflicts over the use of communal forest areas by the occupational castes. Owner users of Thakuri Ban claim that the lower castes over exploit their communal forest, forcing women with shares in communal forests to search farther afield, up into the Lekh, for fuelwood. Personal observations, seasonal calendars, and participatory exercises show that not to be the case. Of the species named by Sunar women in the recall exercise, 13 are found in the Lekh, only 3 in Thakuri Ban, and 6 species can be found in both forest areas. In contrast, Thakuri women named 10 Lekh species, 7 Thakuri Ban species, and 4 species which are collected in both Thakuri Ban and the Lekh. These results indicate that Sunar women spend more time in the Lekh area, and/or collect more species from this area than they do from Thakuri Ban. The numbers provided by the Thakuri suggest that an approximately equal amount of species are taken from each area[29].

I accompanied women on fuelwood expeditions to the forest: a two day census of Lekh users during peak exploitation season reveals that a majority of women exploiting the high forest are occupational caste villagers from Lahchowk, and Brahmin from a neighbouring all-Brahmin community who collect wood to sell in Pokhara bazaar. Very few higher caste villagers from Thakuri Gaun were encountered. A similar count taken at the main access to Thakuri Ban confirms that Thakuri, Newar, Gurung, Thapa Magar, and Rana Bhat women mainly use their own communal forest areas.

Subedi et al. (1991) conclude from their study in the eastern Nepal terai that the importance and scarcity of cooking fuel in the society is demonstrated by the very rich taxonomy of types and the wealth of local knowledge learned by all, even the very young. Research in Thakuri Gaun suggests that scarcity - both absolute and relative - influences IFK. Women whose access to forest area is not limited have little knowledge of diverse forest areas and numerous species because they can collect the best wood from the closest forest areas. As a result, they possess detailed knowledge of only a limited number of preferred species - those collected most often. On the other hand, where access is limited to certain groups of women, these women have great knowledge of different collection areas and the properties of a wide range of species found there.

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[29] The data provided by the Damai and the Sarki presents a different picture, however. Sarki and Damai women named more species which are found in either both the Lekh and Poudyal Ban or in Poudyal Ban alone than are found in only the Lekh. While more Sarki and Damai women were encountered in the Lekh than were Thakuri women, the Damai and Sarki tend to exploit the communal forest of the Poudyal Brahmin more than the Sunar exploit Thakuri Ban.

In general, those women who collect mainly **jinga** - twigs - do not possess much knowledge regarding the fast and slow burning qualities of fuelwood, as species differences are negligible when small sticks and twigs are burned. It is most often occupational caste women who must resort to twig collection to meet their needs. These women from the occupational castes are often more concerned with smoky and smokeless characteristics than burning speed. On the other hand, those women who are owner users of forest area can, and do, collect larger fuelwood, heavier branches and trees. These women do concern themselves with slow and fast burning qualities and ease of carrying.

In addition, because of the reduced access to forests and the increased difficulty of collection, occupational caste women burn a greater variety species than do higher caste women. Occupational caste women more often practice avoidance rather than selection behaviour: "All fodder trees are used for daura," stated a group of Sunar women, "and all citrus tree wood burns well too." Both verbal reports and species preference exercises confirm caste differences in knowledge of fuelwood properties and in species preference.

An occupational caste woman reported that species from the Lekh do not burn as well as the equivalent species in forests closer to the village. The reason given for this was that there are many storms, accompanied by high winds in the Lekh, causing tree branches to fall off. The branches are made wet and dry again and again and they rot and decay and become very brittle. Only the bark portion remains and the inside wood is not solid. This type of fuelwood produces much smoke and not much heat. This knowledge is highly detailed and indicates the intimate relationship between occupational caste women and forest resources.

All village women who use wood as their primary fuel source are concerned with the fast drying characteristics of wood, and the ability to relight wood again after it has been in the fire[30]. A Thakuri woman stated that "heavy fuelwood is better because it burns longer and less wood is needed. Coals of heavy wood retain heat and can be relit even after being put out with water. The top part of the tree burns best - a crown lop. The bottom trunk part has much bark and burns with smoke. The bottom also takes longer to dry." The description of what part of the tree burns the best and dries out most quickly was repeated by many village women; it appears to be common knowledge among women. When the question of what part of the tree burns best was asked of a mixed-caste group of men, the men replied either that all parts burn the same, or that I should ask their wives.

A gradual shifting to a cash economy is eroding indigenous knowledge. One example, which has already been discussed, is the trend towards alternative fuel sources by higher caste and wealthier families. But many forest products are being replaced with non-local, manufactured, store bought goods. As this happens, knowledge is lost. Very few women in the village know, for example, which fuelwood produce the best ash for washing clothes. As older women (who possess 'pre-cash economy knowledge'), and women of the lower castes (who are economically excluded from the new cash economy) reported, white ash is preferred. The women mix the white ash with water and heat it over the fire. As the water comes to a boil they add the clothes and continue to boil until the dirt is out. Women also said that "white ash, which has a high lime content, is also a good fertilizer for garlic [grown in home gardens] because it protects the garlic from insects."

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[30] Occupational caste women, especially older women with large families, are forced to dig roots to burn as fuel. These women report that the roots of all species burn "about the same" but **katus** roots dry out much more quickly than other roots and are, therefore, preferred.

The erosion of indigenous knowledge is most often referred to in terms of the loss of plant and animal species which are potential medicinal cures. Debates and discussions concerning the irredeemable loss of both species and the knowledge of these species have recently been elevated to the global level. The threat of the erosion of this knowledge faces Nepali villagers. While Nepali villagers continue to use a large number of plants and herbs in the treatment of physical and psychological ailments, these traditional remedies are being replaced by modern pharmaceuticals. A health worker comes to the village once a week to distribute modern medicine, and wealthier villagers travel to Pokhara town to the clinics and hospital there. I have strong reservations as to whether the knowledge I discuss in the following section will remain viable beyond the next generation.

3. Knowledge of herbal remedies

There are a large number of herbal plants that are known to the local people as medicinal herbs. Many of them are used as medicine by Nepali people in the rural areas under the traditional method of curing human and animal ailments, injuries, and diseases (Joshi 1984). Speth (1990) reports that in a community bordering Kathmandu there appears to be significant indigenous knowledge of how various herbs, roots, flowers, fruits, bark, resin, seeds, leaves, and stems should be used for specific treatments.

Villagers who possess knowledge concerning herbal remedies can be divided into a number of groups. There are those villagers who possess specialized knowledge, such as village healers and shamans; there are those who possess group knowledge, such as women's knowledge of abortion herbs or the more detailed and extensive knowledge of the Sunar and the Sarki, which is not possessed by other groups; there are those who possess generalized knowledge, such as knowing the names of a number of herbal remedies but not where to find them, how to prepare them, or their specific curative properties.

Some common herbal remedies are known by almost all villagers, male and female, young and old, occupational caste and high caste. The most common remedies named were **satua**, **panch aumle**, **nirbangsi**, **dhaijallo**, and **golkarkre** or **goltapre**. **Satua** is used to treat animal and human wounds. **Nirbangsi** is a herbal medicine for gastritis, the treatment of wounds, and removing poison from animals and people. **Panch aumle** is used for dysentery, headaches, back-ache pain, wounds and burns. **Dhaijallo** is used to treat the common malady known as **kufat** (white tongue), which indicates a stomach, throat, or chest problem; this root is prepared by grinding and mixing with water. **Goltapre** is a shrub which is ground and mixed with water to bring down fever and ease sore throats; it is also used for dysentery and as an appetizer for cattle and humans. All of these herbs are used either for common human ailments or for illness which is common to both humans and animals.

One of the most interesting areas of specialized knowledge is the knowledge possessed and applied only by women. Only women know about abortion herbs and mixtures. I was asked by the women not to name the castes from which this knowledge was obtained, but such knowledge is not the domain of the women of any one caste or group. Women reported that the most common abortion inducers used in the village are **gahat**, beans which are boiled and eaten in great quantity; molasses, boiled and taken in great quantity; and **kubindo**, squash eaten raw in great quantity. The only forest herb which is used by the village women to induce abortion is **rudhilo**, a root ground and mixed in tea and other foods. Women were very secretive about this specialized knowledge, and implored me not to tell village men that these remedies are known and practiced.

Women also possess much knowledge about cures for female maladies. **Gai khure** roots are eaten by mothers after the birth of a child to remove pain; the root is mixed with milk or flour. **Pakhanbed**, as well as being used for wounds and bone breaks, is known to reduce back aches during pregnancy and ease pain during child birth. Villagers know to use the flower, bark, and root of the mango tree - **aamp** - for gastritis, dysentery, and coughs, but women also use the bark in tea as a medicine for breakthrough bleeding and uterine haemorrhage during pregnancy. **Maleeti ko hara** is a root which is mixed with water and taken to restore strength during and after labour.

Although village women do not take any herbals for menstrual cramps, they do use home remedies to reduce a very heavy menstrual flow. **Barimal** is a tuber used for body aches, stomach aches and weakness, and is also highly effective in reducing blood flow, both during menstruation and after the birth of a child. It is mixed with clarified butter (**ghui**), milk, and rice flour. **Barimal** may also be mixed with **kumari**, a shrub - red when dried - which increases **barimal's** effectiveness.

Not all herbal medicines are used to combat physical ailments. **Baramase ko pat**, for instance, is used to stop a particularly frightening type of nightmare where the woman is constantly harassed by a man in her dreams. To effect a cure, the leaves of this red flower are ground and mixed with hot water, and consumed early in the morning, while talking to no one. **Baramase lahara** (the vines of the **baramase** plant) are also used if someone has a fever. It is possible that the plant used here is what Joshi (1984) calls **barhamaso**, although this plant is listed by Joshi as a poison.

As well as the herbs used to treat women only, women also named and described a number of plants collected and used to treat other difficulties. **Kantakeri**, more often known by the local name **bhee ko gera**, is a herb which is widely used as a leach repellent and medicine. **Dunkarno** is a shrub which is ground and mixed with water for gastritis and stomach problems. It is often mixed with **dubo** and **kalnigro** in a paste and eaten for the same ailments. The root of the **bar**, or Banyan, tree is ground and mixed with hot water to relieve gas. **Chuletro** bark and the seeds of the **mauha** tree are ground together and made into tea as a sinus remedy. **Jwano** seeds are fried in oil and then boiled with water and saffron for coughs. **Rudhilo** root, as well as inducing abortion, is used when children have a fever; the ground root is also rubbed around the nose to unplug sinuses.

One of the most effective village remedies for bloody dysentery is the flower of the **gurans** (rhododendron) tree mixed with **dahi** (yogurt). The **gurans** flower is also mixed with hot water to "remove obstructions from the throat" when a person is choking. Other medicines for the treatment of dysentery are **dhairo**, which is mixed with hot water, and the crushed seed of the **sil timur** tree mixed with black salt, hot water, and sometimes crushed garlic and onion. Joshi (1984) writes that the Banyan tree root is also used for diarrhea and dysentery. **Sil timur** is also used to treat gastritis, constipation, and cholera. **Dunkarno** and **dubo** are common remedies for **kufat** (white tongue) and gastritis. **Bhui kerra** (literally "ground banana") is another remedy for **kufat** used in the village. It is most commonly cooked and mixed with water and buffalo or calf dung. **Dahi chamal** root is also ground and mixed with water for **kufat**. The bark of the **chutro** tree is used if a person has an eye infection. The seeds of the **asuro** plant are boiled in water and ingested for fever.

Some herbal remedies were named only by occupational caste women. Even when high caste women were supplied the name of the **joreebuthi** (local term for herbal medicine) they could not describe what it is used to treat. **Umpi ko geda** is used by Sunar women to treat wounds. The seeds are burned in oil first, then the inside liquid is extracted and applied to the burn. **Siuri**, a succulent found in the village, is used by Sarki and Sunar women to treat **kufat**. The latex is burned and then eaten. The only remedies for stomach worms - which afflict most children and adults in rural villages - were known only to Sarki and Sunar women. Guava roots and flowers mixed with the **pathi** plant are the only natural medicines used to kill worms. Higher caste, wealthier villages rely solely on worm medicine sold by the village health worker.

There are a number of other medicinal herbs known only to occupational caste men and women. The root of the **kopase** shrub is used for sore throats. This plant could be the same as Joshi's (1984) **copas/kopas**, a root used for fever. **Nilkanta** is a root which is mixed with another herb, **gurjo**, for sore throats; the mixture is ground, and water is added. **Bhate** is a herb reportedly used for constipation; a similarly named plant, **bethe**, is described by Joshi (1984) as a locally known laxative. The **barbari** herb is used to lower fevers. **Batul pate lahara** combats bodyaches in people and cattle. The bark of the **saharo** species is mixed with flour and eaten for back aches. The flower of the **hatityan** plant is used to cure **kufat**. The root of **gai tihara** is used to treat headaches and colds. **Karkagadi** is a root used in herbal remedies to restore strength and for gastritis in cattle and humans. The **bayair** fruit was also reported to combat gastritis in humans. **Bayair** could be the same species as Joshi's **bayer**, a fruit considered a purifier of blood and an aid in digestion (1984). Fox meat and tiger meat, although not used any more, were known to older Sarki and Sunar women as treatments for swelling joints and limbs.

Although the knowledge of the Sunar is the most extensive concerning herbal medicines, the knowledge of the Sarki is astonishingly detailed. The descriptions below were provided by a group of Sarki men and women and are translated almost word for word. These are only a few examples of the detailed verbal statements provided by the informants. Although some of these remedies have been described above or in other sections, nowhere is a more detailed description provided:

ainselu-yellow and red raspberry; use fruit and root as medicine; baby plants used as a medicine to bring down fever. Found during Baisakh and Jeth months. Juice can be kept for 2-3 years in large amounts for coughs and colds.

nirbangsi-found in the Lekh. Black root used for sore throats in cattle and men. If all animals fall sick, put garlands of the roots of this plant around the necks of the cattle to draw out the illness. This plant glows blue during the day time.

satua-grind root and use for wounds and itches. Induces vomiting if a person has swallowed poison, thereby removing it from the system. Stops vomiting and diarrhea in cholera victims.

hade lasun-tuber used for gastritis in cattle; mixed with garlic, dried fish, and **timur**. Found both in the Lekh and in home gardens for quick use on sick cattle.

bikh-poisonous plant which looks like **nirbangsi** and only expert collectors from the high mountains can distinguish the difference. The village people are afraid to collect it. It is collected during the night when the plant glows white and can be distinguished from blue **nirbangsi**.

tite-used to ease body aches and rheumatism in humans and back aches in animals; it is mixed with rice flour and cooked.

In general, women know more about herbal medicines than do men, but some village men have learned about herbal medicines from watching women prepare herbs when they are sick: "I watched my mother making medicine out of herbs so when I get sick I can make it," explained a young Sunar man. "The reason the men know," stated one man, "is that, although we do not go to the forest much, our forefathers did and have passed down that knowledge. We tell the women to go to the forest to look for these medicinal plants when we are sick." Knowledge is thus passed down through the generations, rather than gained through direct experiential learning. Many of the people interviewed said that they learned about **joreebuthi** (herbal medicine) from the old people who are now all dead. Young men often learn about herbal medicines while they are up in the high Lekh tending livestock. One old man said that he has not forgotten these things (herbal remedies) because he frequently visits his goat herder friends from Reban and the high Lekh.

Three out of four of the healer-priests in the Thakuri Gaun area of Lahchowk are Sarki. Their role as healers requires detailed knowledge of herbs and the properties of locally found plants. Two types of male healers in the village practice the use of herbal medicine on people and animals:

1. **Dhami** are professionals that have received no outside training but learn through practice and generational knowledge. This is the most popular system of treatment of people and animals in Nepalese society; it is estimated that about 85% of the population are served by this kind of treatment (Joshi 1984).
2. **Jhankri** acquire their trade through generational knowledge and experience, rather than formal training. The **Jhankri** system of treatment is similar to the **Dhami** system. Herbal medicines are sometimes used (Joshi 1984).

Men of the occupational castes who are not healers per se possess much knowledge about herbal remedies. On the average, the Sunar and Sarki men interviewed listed 15-20 locally found plants which were used in preventative and curative medicine.

The information provided concerning these remedies was highly detailed. I will briefly discuss the most common herbal remedies known to occupational caste men. **Silagit** is a plant that is eaten by men when they are sick in order to avoid contaminating others with their illness. They also feed this plant to cattle which are healthy so that they will not get disease from other cattle. **Satua**, **dhaijallo**, and **ubijallo** are widely known herbal remedies for gastritis in both cattle and people. **Ubijallo** is also used for lowering body temperature and is applied to wounds which are slow in healing. **Dhaijallo** and **ainselu ko muna** (new leaves of the wild strawberry plant) are also taken with hot water to treat **kufat**, a common symptom of stomach ailments and the most often mentioned sickness in the village. **Nirbangsi**, a large herb found only in the Lekh forest, was also mentioned by most men as a treatment which, among other things, induces vomiting in people and cattle who have ingested poison and who suffer from sore throats. **Nirbangsi** is most often ground together with onion, two types of garlic, and water to treat gastritis. **Bameri** seeds are found around the village; they are mixed with water to ease sore throats when people are unable to swallow. All of the above mentioned remedies are administered as a mixture of hot water and ground or crushed plant.

The most common treatment for wounds and burns is a paste made out of the **jattamansi** plant. Tomatoes are also applied to burns to ease pain. **Golkakre** is a root which is ground and eaten for stomach problems, poison removal in animals and humans, fever, and other ailments. **Panch aumle** was also described as a remedy "for all sickness." **Ban kapase** is mixed with hot water and taken for fever; it is said to keep body temperature down. Both the root **tite** and the herb **ulna** are also administered for fevers and "hot body" in cattle and people. **Padamchalnu** is very effective for easing pain and swelling in bruises and other injuries incurred from falls. The common spice cinnamon, called **ban kowle** when used medicinally and **dalchini** when used in cooking, treats both rheumatism and diarrhea. Stinging nettle (**sisnoo**) tea is taken to stop vomiting.

Men are also extremely knowledgeable about pre-natal and post-natal cattle care. One morning, I observed a Damai man collecting flowers from a vine in my garden. He explained that was cutting **batul pate** vines and flowers to feed to a cow who was experiencing heavy bleeding after giving birth. A Gurung women later told me that women also eat this mixture if they have excessive bleeding after giving birth. Men listed **gohot** (beans), **dhan** (uncooked rice), and two types of plants, **angeri** and **bikh**, as abortion inducers in cattle, and therefore to be assiduously avoided after cows have been bred. **Angeri** will cause the death of the mother as well as the foetus if ingested.

After the calf is born, for one month the mother is fed soft foods only. Roughage feeds such as bamboo leaves, **khanyu**, and **gohot**, which are usually fed, are avoided. Pregnant cattle and new mothers are usually stall fed with corn flour, soyabean flour, rice flour and millet flour all mixed together.

Taking into account the fact that some village men have some knowledge of herbal remedies and often detailed knowledge of livestock care, it is still safe to make the generalization that women are the main knowledge holders in the domain of forest herbs and plant remedies. Women are in the forest most often and can collect these herbs. The kitchen area is the woman's domain, and it is here that herbal remedies are prepared. The health of family members is the woman's responsibility. Occupational caste women, who spend more time in the forest than high caste women, and are often not in a financial position to buy modern medicine or visit a clinic in another town, use these traditional remedies far more often and possess broad and detailed knowledge in this domain. I turn now to another domain where the knowledge of women and children of the occupational castes is superior.

4. Forest foods

Knowledge of herbal remedies, like knowledge of fuelwood and fodder, is passed down from mother to daughter. It is shared with friends and other female relatives. Knowledge of forest foods, however, is both learned from and shared with peers. Children of the occupational castes especially possess much knowledge about forest foods. There is a difference in forest knowledge between women and children in this domain. While children's information was detailed concerning "eat-on-the-spot" foods - such as acorns and raspberries - women had more knowledge of collectable food items and those foods that need to be processed - such as mushrooms and tubers.

Women are also aware of a number of forest plants which have dual uses as food and medicine. **Padam chalnu**, for example, is used to treat wounds and bodyaches in people and bone breaks in cattle; it is also used to make a chutney or pickle called **achar**. Also common knowledge among village women is the use of **simal ko bokra** - the bark of the **simal** tree - as a natural yeast for the preparation of bread. **Simal ko bokra** is soaked in water and mixed in **sel roti** (literally, salt bread) to make the **roti** soft and flavourful.

Within the female domain of forest food knowledge there was, again, a division between higher caste and occupational caste women. Occupational caste women possess much more knowledge about forest foods. Forest foods are an important part of the diet of poor households because they lack the land to grow enough food and lack the financial resources to buy food. Another reason for the greater knowledge of occupational caste women is their presence in the forest all year round. Fruits and vegetables that are ripe during the season of heavy agricultural labour are not widely known among higher caste women. Sunar, Sarki and Damai women, who go to the forest during these months, have knowledge of these foods.

Sunar women and children named several fruits that are often picked in the forest: **guieli** is a small, sweet red fruit; the black seeds of the **chutro** bush are eaten raw; **gade ainselu** is a small wild raspberry which grows in great quantities in the forests surrounding Lahchowk; **kafal** is a favourite fruit which is somewhat like a mulberry[31]. All of these fruits are available starting in the month of Jeth. **Amala** is a medium-sized white fruit, available all year round; **narianci** is a wild citrus fruit available Mangsir through Poush. Forest vegetables are also harvested by women, mainly occupational caste and other poor women. Sprouts of ferns and flowers (eaten as vegetables) are commonly, but randomly, collected.

Regularly collected by the women and children of poorer households are **chow**, **halale**, and **tarul**. **Chow** are hand-sized white mushrooms cooked in **tarkari** (vegetable dish eaten with rice); **halale** is the wild version of **sag**, a leafy vegetable similar to the spinach which is grown in home gardens; **ban tarul** is a tuber dug from the forest and cooked like a yam or potato. Several poor occupational caste households in Thakuri Gaun eat **tarul** as their main vegetable.

In contrast to the above descriptions supplied by occupational caste villagers, a group of Thakuri could name only four forest foods, all fruits found during Jeth-Asar: **ainselu**, **katus**, **chutro**, **kafal**. The above lists and descriptions of forest foods are not exhaustive. More information can be found in Appendices C, D, and F.

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[31] Indigenous knowledge is also communicated through songs and sayings. This is the case with the **kafal** fruit. At the same time of the year that the **kafal** fruit is ripening - in the month of Jeth - the Asian cuckoo begins to sing loudly in the forest. The four trills of the cuckoo are said, by Nepalis, to translate as "ka-fal pak-yo," meaning "the kafal fruit are ripe". It sure sounds like it to me.

5. Fodder resource management and indigenous knowledge

Lahchowk community has a large area that can be classified as communal forest, but according to villagers there are very few species either within the communal forest or on private land that provide a sustainable supply of fodder for livestock. Fodder collection is a year round activity. Unlike fuelwood, fodder cannot be collected in large amounts and stored for long periods of time because it dries out and loses its nutritional effectiveness, and because the flushes of new leaves on trees are seasonal and must be collected when the leaves are at a certain stage of maturity. Both fodder and labour availability for livestock care have seasonal distribution. During the rainy season, labour is scarce and fodder is not; whereas during the winter, fodder is scarce and labour is not. Rusten's (1989) observations coincide with my own: villagers try to use the available fodder efficiently by feeding animals different foods in different seasons and according to the life-cycle of each animal. Thus, the management of fodder species depends on land use patterns, seasonality, labour, the types of cattle raised, and the types of fodder which will increase milk production and enhance cattle health.

Lahchowk farmers feed certain fodders with the health and productivity of their cattle in mind. Villagers raise four main types of livestock: 60% of village livestock are buffalo, 20% are goats, 15% cows, and 5% bulls (Nepali 1991). The types of fodder and techniques of feeding differ for each kind of animal and villagers possess much knowledge pertaining to the availability of certain species of fodder for different types of livestock. Villagers give preference to fodder species from the Lekh forest, but as these are not readily accessible they must satisfy their fodder needs with what is available in the village and the closer forest areas. Villagers reported that about 60% of fodder comes from crop residues, 25% from grasses, and 15% from trees. As tree fodder resources are mainly found in the household area, their distribution and quantity are limited.

Poorer villagers suffer the most because of this inadequate supply of fodder. Because they do not possess large landholdings - **khet** or **bari** - where crop residues and other fodder can be collected, they must go to the forest daily in an attempt to meet their fodder needs. This is a precarious situation, for if the person responsible for fodder collection gets sick and there is no one available to take over their work, the cattle must go hungry which reduces strength and milk production.

Informants indicated that due to a lack of sufficient fodder trees, grasses and crop residues from **khet** and **bari** land are mixed in order to increase the production of milk in cattle. Women stated that as there are not enough fodder trees and it is hard to collect fodder from the Lekh, they feed cattle a mixture of **bhui ghaas** (shrub and grass fodder, literally "ground fodder"), **khet ko ghaas** (fodder from fields, usually residues and husks), and **dale ghaas** (tree fodder). Although the amount of actual fodder from tree species is very little, the number of tree species utilized is far greater than the number of non-tree fodders. Villagers named four times as many tree fodder (**dale ghaas**) species as they did ground fodder (**bhui ghaas**) species, as the lists below illustrate:

Dale Ghaas

chuletro
pakhuri
kaulo
phaledo
baans
kutmiro
kavro
tihare phul
machayno
nigaalo ko jhyanpo
nimaro
tanki
khanyu
chiuri
dudhilo
phalant
muni
dhairo
mangsir katus

Bhui Ghaas

babiyo
siru
kharu
nal and paral
karaute

Choice of fodder species is directly affected by the seasonal availability of fodder. Nepali villagers have developed traditional calendars to control the scheduling of lopping and cutting activities. For eight months of the year the predominant fodder is tree fodder and for the remaining four months farmers primarily make use of ground fodder. The greatest amount of tree fodder is fed during Mangsir. Tree fodder is fed in smaller quantities during Kartik, Poush, Magh, Phalgun, Baisakh, Jeth, and Asar, and not at all during the remaining months.

Tree fodder is collected mainly during winter and low rainfall months: "We prefer to feed our cattle these species (tree fodder) during winter because at that time grass fodder is less abundant. If we mix these species with crop residues, more milk is produced." Another reason mentioned for mixing tree fodder with crop residues is that tree fodder is fed for eight months out of the year and hence there are insufficient quantities of this fodder alone (Nepali 1991).

From Sawan to Asoj the main fodder utilized is ground fodder. During these months grass growth is new and the shoots are especially nutritious. Ground fodder is collected from forest, **khet**, **bari** and **khar bari** areas.

Fodder is supplemented with cooked mixtures, called **khole**, during the winter months. The most common cooked feeds are rice flour and corn flour; rice flour, wheat flour and soyabean flour; and, rice flour and black lentils (**maas**). These mashes are said to increase milk production. Villagers feed cattle the residues of millet after brewing their local alcohol known as **raksi**; this feed also increases milk production. Villagers also cook a mixture of grain and straw, **kundo**, during the winter months. The necessity for cooked feeds drastically increases fuelwood demand during the winter months.

Rusten's case study describes in detail the sophisticated system used by farmers in one village in Parbat District, Nepal, to evaluate which fodder is suitable for harvesting (Rusten 1989). Rusten reports that tree fodder is evaluated and classified on a bi-polar scale with the two poles defined as **chiso** and **obano**. **Chiso** is a Nepali word generally used to describe something that is cold and damp, while **obano** generally describes something that is dry, and possibly warm. Farmers classify only a few species of fodder are being purely **chiso** or **obano**. Most fodder falls between these two extremes of classification forming a more dynamic middle group that changes over time. Fodder tends to move along the scale becoming more or less **chiso** or **obano** depending on the time of year.

These terms describe both the physical attributes of the fodder leaves and, more importantly, the physiological effects that fodder commonly has on livestock. The villagers in Lahchowk and in Rusten's Parbat village reported that the best quality fodders often have **obano** attributes, which not only describes the physical character of leaves, eg., being relatively dry, stiff, and leathery, but it also infers that when animals are fed **obano** fodder it will:

1. lead to the production of good, firm, relatively dry dung without causing constipation,
2. improve the general health of livestock,
3. cause the livestock to gain weight,
4. be eaten well and satisfy the animal's appetite, and
5. contribute to the production of milk and clarified butter (**ghui**) (Rusten 1989).

Conversely, **chiso** fodders are often considered poorer quality fodders that usually need to be mixed with other more **obano** fodders before being fed to livestock. As with the term **obano**, the term **chiso** describes both physical attributes of the fodder, eg., being relatively supple, succulent, and smooth, but possibly more important it describes the physiological effects that the fodders of this type commonly have on livestock. Villagers reported that if **chiso** fodders are fed to livestock in excess they will:

1. cause animals to produce watery dung;
2. cause the loss of weight in some cattle;
3. weaken animals and cause them to lose their appetite, and possibly cause a blockage in the stomachs or throats of the livestock;
4. not satisfy the animal's appetite; and
5. not increase the production of clarified butter (Rusten 1989).

As Nepali (1991) notes, **chiso** fodders are not automatically thought of as "bad" fodders, and neither are **obano** fodders automatically "good" fodders. The amount, seasonality, and age of the fodder resources, and the way in which different fodders are mixed together affect the rating and classification of **chiso** and **obano** fodders. Farmers first decide on the relative quality of a fodder as either **chiso** or **obano**. Once a judgement is made about the quality of a specific fodder, farmers may then make a series of other decisions about the quantity of **chiso** and **obano** fodders that will be collected and fed to their livestock (Rusten 1989). It is suggested that farmers use this **chiso-obano** evaluatory system for more than just determining what tree fodders should be harvested. Farmers also appear to use their qualitative understanding of **chiso** and **obano** attributes of fodders, along with their knowledge about other aspects of specific fodders, to formulate feed for their livestock that consists of a variety of fodder types to achieve personal production goals.

While Rusten discusses fodders which are classified as either **chiso** or **obano**, or somewhere along the scale between the two, research in Lahchowk revealed that **chiso** and **obano** labels apply not just to certain species of fodder during certain times of year, but also to the methods of feeding. The women "make" **chiso** and **obano** by mixing different fodders together. **Obano** fodder, which is the preferred type and is a "warm" and "dry" fodder, can be made from **chiso** fodder by drying leaves and grasses (Nepali 1991). This knowledge thus changes the way that farmers evaluate and classify fodder species. Village women stated that they would prefer to feed "true" **obano** species to their cattle because they promote a healthy stomach, but as these species are scarce in the Lahchowk area they must make **obano** fodder from **chiso** species. In fact, certain combinations of **chiso** and **obano** fodders are preferred to feeding one fodder type or one fodder species only.

Thakuri Gaun women stated that goats, cows and buffalo can eat **chiso** fodder, but that cows and buffalo can eat **chiso** only in small amounts. Consequently, **chiso** fodders are either mixed with **obano** fodders, or are made into **obano** fodders for feeding to cows and buffalo. For example, Thakuri women reported that stinging nettle (**sisnoo**) is a good buffalo fodder because it increases milk production and "keeps the stomach dry"; but, because it is a **chiso** species, they do not feed it during rainy or cold months. It can be dried before feeding, however, "to dry out the thorns and turn it into obano fodder". It is then mixed with dry rice residue (**paral**): "sisnoo is green so it is good to mix it with dry feeds".

Eric Rusten's 1989 study revealed that women and men evaluate and classify fodder differently. From his own analysis of local classification of knowledge and the perceptions of men and women he concluded that there are domains of knowledge and perception of fodder use, management, and cultivation which are both common to and differ between the genders. Rusten writes that men have particular interest in, and possibly more knowledge of, aspects of tree fodder related to 1.) fodders that are good for both milk and clarified butter production, and 2.) fodders that have **chiso** attributes. The men of Thakuri Gaun reported that the new leaves of **baans**, **nigaalo**, **berulo**, **pakhuri**, **kharu**, **kutmiro**, **chuletro**, **berulo**, **badhar**, **tite ko munta**, and **pani amala** all increase milk production in cattle. These tree fodders are preferred over crop residues, which are the main cattle feeds.

Rusten suggests that women have specific interest in, and possibly more knowledge about, trees that are both good sources of fodder and good sources of fuelwood. This is the case in my research area. In Lahchowk, however, because men are so often out of the village, women are often the main decision makers concerning fodder management and therefore they possess significant knowledge about all fodder attributes. For example, women provided detailed knowledge of fodder types and combinations which increase milk and clarified butter production, a concern which Rusten attributes to male villagers. Women informants stated that a marked increase in milk production results from the feeding of **berulo** and **badhar**. The best supplement to increase milk is gram flour (**besan**), but this flour is very expensive. **Dubo** grass increases both the production of butter and milk.

The three fodder species preferred overall by men and women are **berulo**, **chuletro**, and **kutmiro**. **Berulo** is cultivated on private land and is collected regularly by women. It is known to positively affect milk production in cows and buffalo and, along with **badhar**, is fed predominantly during the winter months. **Berulo** is also used as fuelwood, and thus is a preferred species of village women.

Chuletro trees are grown around the household and, although this species is not reported to aid milk production, it is easily cultivated and collected. It is classified primarily as a **chiso** fodder, but if put in the sun right after cutting it can be fed to all animals in large quantities. It is a preferred species of both men and women because it is readily available. **Kutmiro** is a large tree and difficult to climb. Consequently, most **kutmiro** fodder collection is done by men. The leaves are large, and increase milk production in cattle. The branches are used as fuelwood.

Villagers explained that certain fodders were good for all livestock, whereas others should not be fed to any animals except goats (see Table 2). Goats usually receive less preferred fodders because they are used neither for draft nor for milk. A group of Sunar and Thakuri women named **harowlo**, **samo**, **maleero**, **chilaune**, **tite ko lorto**, **khanyu**, **malo**, **muni**, **rhudilo**, **dubo**, **nigaalo** shoots, **panisaro**, **pani amala**, and **baydulo** as the fodders which can be fed to all animals. **Karduch** can also be fed to all livestock, but only in small amounts. **Dhobine** and **khamle** can also be fed to buffalo, cattle and goats, but must be mixed with rice residues in winter to aid digestion. The fodders which can be fed only to goats are **phokse**, **angeri**, and **pathi**. Table 2 presents information from a cross-section of informants, and shows the preferred fodders for each type of livestock.

Villagers harvest tree-fodder by rotating among different forests, plots within forests, clumps of trees on private land, trees, and even branches of the same tree so as to distribute the pressure, allow sufficient regrowth, and keep the fodder from becoming exhausted. Villagers in Lahchowk report that lopping should be done carefully, because cutting badly reduces the amount of vertical and horizontal branch growth. They harvest fodder with a clear understanding of good pruning techniques, leaving some primary growth on each limb for further leafy growth. Rusten (1989) observed that people often leave about one meter of twig on the trunk and harvest fodder only from the remaining top portion. This practice allows faster regrowth of leaves. There are three main lopping patterns of trees practiced by the villagers of Lahchowk. These are described by Nepali (1991):

1. Lopping the whole tree - The main reason for lopping the whole tree is that, although tree height will not

TABLE 2 - FODDER PREFERENCE BY LIVESTOCK SPECIES

Livestock Species: Tree Species:	Buffalo	Cow	Goat	Oxen
Berulo	1	2	3	4
Phaledo	-	-	1	2
Chuletro	1	2	-	3
Pakhuri	1	1	3	2
Kavro	1	-	-	2
Khanyu	1	2	-	-
Kharu	1	-	-	1
Khav ko Ghaas	-	-	-	-
Nimaro	1	2	3	2

increase, there will be an increased flush of new leaves. This pattern of lopping is usually practiced on old trees that will die soon anyway. Later, the wood and branches from the dead tree will be used as fuelwood.

2. Lopping the tree from the axil - The axil is the portion of the tree where the branch joins the main stem. Lopping from the axil is practiced on preferred fodder trees that are young and valuable to the villagers. The villagers try to maintain these trees for a longer period, reporting that "cutting from the axil will make the tree have more branches, and the new leaves of the axil are nutritious." As well, this lopping technique will check the height growth, which helps the people to climb more easily to collect fodder. Research revealed that women prefer shorter trees that they and the children can climb more easily. Consequently, women tend to lop trees from the axil, which results in more branch growth.

3. Lopping from below - If the villagers want to increase the height of a tree, thus increasing the length of time the tree can be used, they cut from below. The branches will be used as firewood and the leaves fed to the animals, fulfilling dual needs. Men prefer to grow taller trees, mostly lopping from below, because they can convert these trees into timber for profit.

Different species of trees are cut during different times of the year and according to different lopping techniques. For example, a group of women explained that **chuletro**, because it is very thorny, is lopped from below. **Chuletro** is lopped from Poush to Phalgun. Every three or four days during these months fodder is harvested until the tree is completely lopped. The tree is then left for 9-10 months to regenerate.

Overall, harvesting practices designed by villagers seem to be simultaneously scheduled and regulated so as to maintain a sustainable supply of fodder, and flexible so as to fulfil the varying needs of the users and their livestock. The uniformity of responses to the questions aimed at gathering knowledge of fodder management indicate extensive indigenous silvicultural and botanical knowledge, if only of the commonest species.

There is evidence, writes Rusten (1989), that shortages of public sources of tree fodder in some areas of Nepal are motivating farmers to intensify cultivation and management of fodder trees on their own land by expanding extant agroforestry systems. Scarcity of fodder is an issue for the villagers of Lahchowk, and private tree cultivation is on the increase. This will be discussed in more detail in the next chapter.

This chapter has attempted to describe the wealth of environmental knowledge which is daily applied, tested, reformulated, and reapplied by Thakuri Gaun villagers. Because this process is largely individual, knowledge too should be unique to individuals. But common experience, common beliefs, common language, common environment, common needs and wants create systems of knowledge which are, to varying degrees, shared. The result is a number of cross-cutting domains of knowledge, defined not just by the knowledge itself, but by the knowledge holder. There are a number of variables which influence an individual's possession of knowledge in certain domains. The more of these variables that two people hold in common, the more likely it is that they will share common domains of knowledge. Who knows what is not random; it is predictable.

The above discussion focused primarily on fuelwood: perception of characteristics; species preferences; knowledge of use, location and seasonality. The exercises and activities conducted with the villagers - as well as group interviews, key informant interviews, and trips to the forest with groups of women - explored different aspects of forest knowledge, with the result that what finally emerges is a complex but largely unified system.

In addition, I looked at more specialized knowledge of herbal cures and forest foods, domains of knowledge which house numerous sub-domains of knowledge holders. The complexity of classification of diseases and cures was but glimpsed, and I suggest that there is rich potential for further research on this subject. Lastly, I presented information on fodder resources, their classification and management. The possession of knowledge in this domain is less a function of gender than it is of caste, class, and economics.

To conclude this chapter, and to bring together the large amount of data presented above, I will summarize the main differences in knowledge between occupational caste and high caste women, and discuss the reasons for these differences.

High caste women in Thakuri Gaun typically have much work in their own fields, so they cannot go to the forest every day. To overcome this potential conflict between meeting their farm and forest labour obligations and to meet their fuelwood needs they go high up in the communal forest and also up to the Lekh forest on the days that are free from agricultural work and collect very good fuelwood that will last longer.

Higher caste women, because they exploit the forest for only five months out of the year (due to the high agricultural labour input into their own farm gardens and fields), must go higher up in the forest to collect fuelwood which is larger, heavier, and will last longer. These fuelwood expeditions start out before sunrise and return in the early evening. Travelling to and from collection areas consumes 60-70% of their time and they must collect wood quickly in order to be home before dark. There is little time to sit, rest, and talk about forest resources.

The occupational castes, who have few fields of their own and who do only occasional wage labour in the fields of others, usually go to the forest - Thakuri Ban, Poudyal Ban and the Lekh - every day and in all seasons. Occupational caste women go to the forest all year round and are able to exploit a range of forest areas. This has two results: firstly, walking time is reduced because they can collect non-preferred and smaller fuelwood which is plentiful; and secondly, because these women are in the forest every day, they need to gather only enough firewood for one or two days, and the pressure to collect large amounts of heavy wood is reduced. They therefore have more time to investigate different plants along the trail and discuss their knowledge with one another. Occupational caste expeditions involve more socializing than high caste fuelwood expeditions, and much time is spent stopping to rest and talk, usually about forest resources. Because occupational caste women go to the forest all year round they are more aware of the seasonal cycles of plants and know about many plants that high caste women do not.

Bennett and Acharya (1981) found considerable caste and ethnic (community) variation with regard to sexual division of labour for fuel collection, animal husbandry, entrepreneurship, and wage employment. I observed and recorded significant differences here and also within the household sphere concerning child-care and food processing. There is a much more fluid division of labour within occupational caste households, with men tending children, going to the forest with female family members, and helping in food preparation. Subedi et al. (1991) note this same pattern in the terai area of Nepal, where among the poor collection labour is shared by adult men and women, and older children of both sexes.

The higher castes adhere more to the traditional Hindu division of labour than do the occupational castes. They see themselves as responsible for upholding Hindu traditions and are more conscious of these rules. Because of their higher caste status, there is more pressure on them from other villagers to behave correctly. There are very few tasks commonly performed by both genders. High caste women work in forest, field and home; men work in field, business and rarely, if ever, in the forest. More high caste than occupational caste households own their own fields, and high caste men and women are busy many months of the year working at gender defined agricultural tasks.

In general, occupational caste women possess more IFK than higher caste women. Higher caste women perform more labour in their own fields and generally exploit forest resources for only five to six months out of the year, during agricultural slack season. Occupational caste households seldom own their own fields and, although women do work as agricultural wage labourers, they still go to the forest all year round.

A general conclusion which can be drawn from this data is that villagers of the occupational castes possess more ITK concerning forest products - identification, species name, attributes in relation to common uses of the species, location, and availability - than do villagers of the higher castes. This conclusion is fully supported by the data collected in Lahchowk. Sunar men and women identified almost all the species found in the lower forest. In contrast, groups of Thakuri men and women were able to identify only 60-85% of the species identified by the occupational castes. Likewise, the most valuable informants concerning medicinal herbs were an old Sarki woman and a group of young Sunar women and men.

This chapter has presented some of the practical resource knowledge of the women of Thakuri Gaun, and discussed differences in knowledge and the reasons for these differences. My research shows that, indeed, some indigenous knowledge is a purely a female domain. This knowledge pertains to women's cultural and economic roles and is usually unknown to men. Molnar writes that "...women often have a better knowledge base than men in the same locality about the qualities, growing patterns, and potential uses of forest species and grasses" (1991:83). Since women in Lahchowk are primarily responsible for food, medicine, and fuelwood, their knowledge is unique to them and not generally included in the male knowledge domain.

But this is not to imply that men do not have knowledge of trees and tree products, for just as some knowledge is unique to women, so are there predominantly male domains of knowledge. "Because knowledge is part of the social fabric in which people live, and gender is one of the primary dimensions of social fabric, the study of indigenous knowledge systems must include gender as a factor" (Norem 1988:7). A focus on gender issues in knowledge systems means focusing on both women's and men's knowledge systems. The above discussion of indigenous knowledge dealt mainly with women's knowledge. The following chapter looks men's knowledge of trees and tree products.

CHAPTER 8
MEN'S KNOWLEDGE

Although the main discussion of indigenous forest knowledge must focus on women's knowledge, it is essential that the knowledge of men be discussed. Women are the main forest users, but men, too, go to the forest, and possess certain types of forest knowledge that are exclusive to them. In addition, I believe there is a critical complementarity between male and female knowledge domains within a culture. For comparative purposes, and to foster a holistic and systemic understanding of forest use, we must explore men's knowledge.

1. Gender differences

Rocheleau (1991) writes that in Kenya men's outmigration and formal schooling have mitigated against the transmission of gendered science and practice to the young. There is also evidence of this trend in Lahchowk. With the establishment of the local school, more and more young people - especially young men from the higher castes - are leaving the village after receiving a formal education. In addition, many young men leave the village for wage labour in other parts of Nepal and in India and Hong Kong.

The increasing lack of involvement of males in the traditional economy is reflected by the lack of forest knowledge among high caste youths, both in relation to their occupational caste counterparts and in relation to high caste women. While some men know a great deal about specific classes of trees and wild plants for specialized purposes, knowledge is unevenly distributed among male villagers and is significantly less among the younger high caste men in the community.

Men possess forest product and tree use knowledge in several domains. They are the main utilizers of **nigaalo** and

baans[32]; they, along with women, are responsible for fodder collection; although women do much of the manual labour in house construction, men are ones who work exclusively with timber; the main healers in the village are occupational caste men; only men build live fences in the village. Men seem to know much more about land measurements and the monetary aspects of forests and about trees grown on private land, whereas women know more about the biological aspects of forest products and management.

In Lahchowk village, men and women exploit different forest areas. Men typically go to lower areas closer to the village for fodder, and, for a few weeks of every year, to one or two **nigaalo** growing areas further up in the high forest. Although women are responsible for feeding cattle and almost all of the forest fodder is collected by women, in Lahchowk area much of the fodder fed to cattle is collected from around the home by men rather than from the forest. Men appear to have greater responsibility for collecting tree fodder from trees cultivated on private land, while women appear to concentrate their fodder gathering efforts from forest trees[33]. As a result, men possess a great deal of knowledge concerning cultivated fodder tree species and their properties.

2. Caste differences

Caste differences in IFK are more pronounced in the male sphere than in the female. Higher caste men are often better educated and work as small businessmen, teachers, on the village committee, or in office jobs in the larger towns and cities. Thakuri and Brahmin men rarely engage in the making of baskets and mats, and if they do need **nigaalo** products it is often the women who collect them. The wood resources that high caste men work with - fodder trees, **baans**, and timber - are found mainly in their own fields, and only occasionally in the forest. On the other hand, Sunar men's knowledge of forest resources, although not on a par with Sunar women, lags not far behind. Sunar men identified as many of the fodder and firewood species as Sunar women identified, and 70-80% of the herbal medicines. Sunar men are also more familiar with the properties of different tree species than are men of other castes. There are several reasons for this.

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[32] **Nigaalo** is a small species of bamboo which grows widely throughout the middle hills. The scientific name for **nigaalo** is *Arundinaria intermedia*. **Baans** is the larger variety of bamboo found in the middle hills of Nepal. It is known by the scientific name *Dendrocalamus strictus*.

[33] This pattern is in direct opposition to that recorded in Rusten (1989).

Firstly, there is less division of labour overall between Sunar men and women. A work-time allocation study that I conducted in Thakuri Gaun[34] revealed that among the Sunar, men and women share much of the same work. Sunar children go to school less regularly than do children of the higher castes. Sunar boys, therefore, are frequently in the forest with their sisters and mothers. In addition, during the late stages of pregnancy and in the months after a child is born - when women cannot collect firewood - Sunar men regularly go to the forest. The occupational castes have fewer financial resources and smaller landholdings than the higher castes, and collecting firewood themselves is often the only option for men.

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[34] This was a small study that I conducted over the course of a week during a break in my regular interview schedule. The study consists of interview data collected from individuals on a number of tasks ranging from meal preparation to child care, planting and herding. The study was conducted to determine the division of household labour and the regularity of task performance, whether daily, weekly, monthly, or seasonally. The presentation of this data is beyond the scope of this thesis and will be presented elsewhere.

Sunar men also go to the forest to get herbs, and can recognize many fruits, plants and poisonous shrubs. When asked "How do you know about firewood?" they answered, "**khana jandaucha**, **pakowna jandina**?" or "If we know how to eat, then won't we know how to cook?" Sunar men also say that they know more about the forest than Thakuri men, and are proud of this fact. Sunar, Sarki and Damai men were all observed going to the forest to collect fodder and fuelwood, though not regularly.

Secondly, Sunar men engage in charcoal making and goldsmithing if they remain in the village. Their work requires a detailed knowledge of the burning properties of different woods and requires them to go to the forest more often in search of these woods. Balla et al. (1990) report that in the Pokhara area both the charcoal producers and consumers have specific perceptions about good and poor quality charcoal. Sunar men who work with charcoal have a definite mental list of the qualities of good charcoal. Good charcoal produces less ash and therefore does not spread around when air is blown. It has a hard, not a crumbly, texture; lasts longer; produces less smoke; does not spark ash or pop; ignites easily and is extinguished easily; and has an extremely black shiny colour. Sunar men can identify the species of a tree from the sight, smell, and feel of the residual coals alone.

Sunar men make sickles and other agricultural implements, using the charcoal from **katus**, **arupate**, **gurans**, and **thowne**. The wood from certain tree species is better for making certain agricultural implements. Plows (**halo**) are typically made from **guiali** and **chilaune**. Oxen yokes for plowing (**juwa**) are fashioned from **katus**.

Sarki men also possess more forest knowledge than do their higher caste counterparts. This, as with the Sunar, is partly attributable to both decreased division of labour and traditional occupation. Division of labour is not highly pronounced between Sarki men and women and, as a result, IFK seems far less gender-specific. Sarki men work with **nigaalo** and **baans**, making baskets and mats that they sell in the village. They are also the caste most often hired for house construction, which requires the cutting and fashioning of timber. Sarki men also know about medicinal remedies from the forest. The knowledge of medicinal plants among the Sarki men that I talked to is not as extensive as that of the Sunar, probably because the Sarki are such a small caste group in Thakuri Gaun and my sample, therefore, was limited. Although knowledge is cultural and culture is, by definition, shared, each individual's knowledge is only partial compared to the total pool of group knowledge. The knowledge Sarki men do have, however, is very detailed.

3. Construction

Although both men and women, high caste and occupational caste, are involved in house construction, it is mainly occupational caste people who are hired by the higher castes to build houses and it is the men who work with timber. The following description of the house construction knowledge domain is based mainly on information collected from Sarki and Damai men, but also includes data from certain knowledgeable men of other castes.

People generally try to use trees from their own home fields for construction purposes, but they rarely have adequate tree resources on their own land to supply timber for the construction of an entire house. Owner users can pay a fee to the D.F.O. to cut timber in the communal forest, but those who have no **bijan** must either buy trees from those who do have **bijan** (at exorbitant rates) or exploit other forest areas - Reban Ban, the Lekh - for building materials. The best Lekh forest timber is found two to three days walk above the village. Much timber is also taken from the forest across the Mardi river. Only during certain times of the year does the

D.F.O. grant the 15 days license which must be purchased to remove timber from the forest.

The selling cost of timber trees is determined per cubic foot. Two rupees per cubic foot is the standard price; preferred species are much more costly. A single tree, depending on size and species, costs between Rs.800 and 2000. But some large, preferred trees have been purchased for as much as Rs.18000. An average house requires three or four large trees and around fifteen small trees. Smaller trees, such as bamboo, may cost only Rs.30-40 each. Raw timber is usually taken to nearby Hyangja sawmill to be sawn into pieces. Stones must also be purchased from villagers whose land has a good quarry site on it. Stones are purchased according to cubic feet and it was reported that 45 cubic feet of stone costs Rs.600.

Hired workers are paid by the day; the rate of pay is established by task. The most poorly paid labourers are women; they carry stones from the quarry site to the construction site and earn only Rs.30-40 a day. Wood carvers and wall makers are all men and earn Rs.60 and Rs.90 per day respectively. If many workers are available, a house can be built in under twenty days.

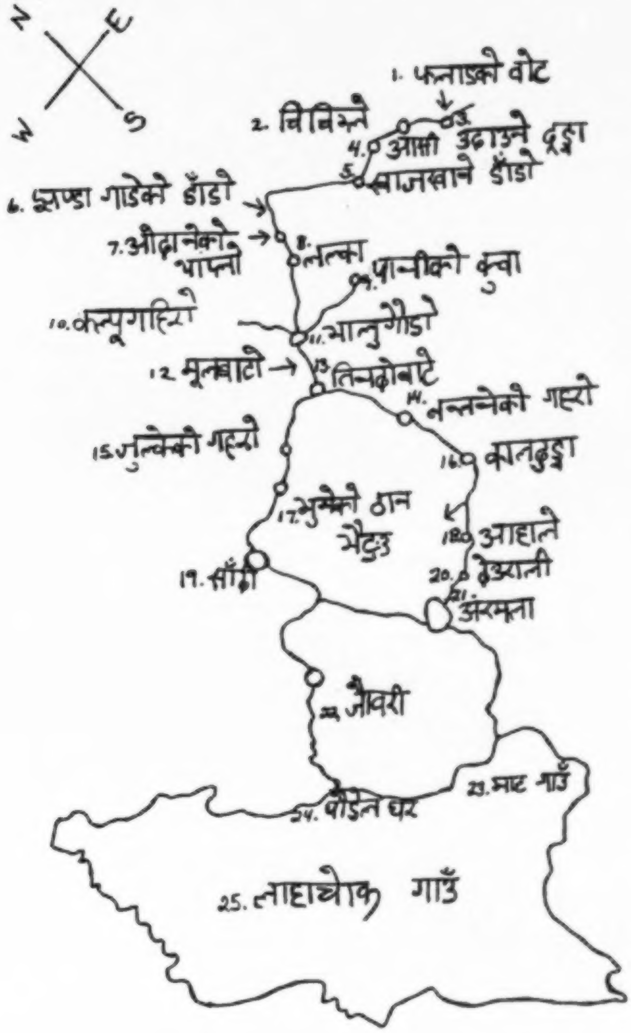
There are a number of preferred tree species used for house construction: **sal** (not found in the area), **chaap** (very difficult to get), **dabdabe**, **jingano**, **malo**, **simal**, **khirro**, **gurans**, **phalant**, **thowne**, **kaulo**, **malaato**, **dar**, **arupate**, **silinge**, **utis**, and **sissoo** (not found in the area). **Chilaune**, **ruktachandan** and **katus** were the second choices of most men, and the most often used species because of availability. The third choice for timber is fruit trees. Fodder tree species are also used in house construction; the main types utilized are **berulo**, **pakhuri**, **kavro**, **lakuri**, **kutmiro**, and **chuletro**. The criteria used to determine good timber species are strength, longevity of the wood, straightness of the bole, resistance to insects (especially termites) and rot, ability to withstand erosion from rain and wind, and aesthetic characteristics of the grain.

4. Bamboo

Bamboo is used quite extensively in house construction and for a multitude of other purposes. Two general types of bamboo are used: **nigaalo** which is found in the forest area, and **baans** which is grown in home gardens and **bari**. The men use bamboo strips to tie house rafters together and also use bamboo for support beams, rafters, posts and fences around home gardens (**balam**).

Baans and **nigaalo** are also widely used by villagers for a variety of purposes other than construction, and because of their extensive use men possess much knowledge about the location, proper cutting techniques, and characteristics of different bamboo species. Although it was reported by the men that "only men know how to cut and fashion these materials properly", women are involved in the collection of **nigaalo**.

There are several different types of **nigaalo** found in the Lekh. **Nigaalo** and **laharo** (the vines used to tie baskets together) are collected when the men have free time from their other work, generally during the months of Poush and Chait. The best **nigaalo** growing areas are two days walk from the village (see Figure 4). The preferred type is **malungo** (also pronounced **malunge** and **malunga**), because it does not have "knots" - nodes and internodes - and is therefore easier to work with. **Malungo** is a multi-purpose species and is also preferred because its shoots are tasty for eating. The best areas of the Lekh for the collection of **malungo** and other preferred types of **nigaalo** are Thulka, Kabjet, Barsyandi, Odane, Udindunga, Tindobate, and Kalpugaira. **Ghunde nigaalo** is also collected from the Baitum area of the Lekh but is less preferred because of its limited use for making carrying


N
E
S
W
1. फलाडको बोट
2. चिचिम्ले
3. अडाउने ढुङ्गा
4. आसी
5. खाजखाने डाँडो
6. झण्डा गाडेको डाँडो
7. औंढानेको थाप्लो
8. लल्का
9. पानीको कुवा
10. कल्पुगहिरो
11. भालुगौडो
12. मूलबाटो
13. तिनदोबाटे
14. तन्तनेको गहरो
15. जुल्केको गहरो
16. कालढुङ्गा
17. भुम्केको ठान भैटुउ
18. आहाले
19. साँढी
20. देउराली
21. अरमला
22. जौवरी
23. भाट गाउँ
24. पौडेल घर
25. लाहाचोक गाउँ

1.Phaladko bot
2.Chichimlo/e
3.Adowne dunga
4.Asi
5.Khaj khane dado
6.Jhanda ghadeko dado
7.Awdane ko thaplo
8.Lalka
9.Paniko kuwa
10.Kalpugaira
11.Bhalugowdo
12.Mulbato
13.Tindobate
14.Tantanayko gaharo
15.Julkayko gaharo
16.Kaldunga
17.Bhumayko than baytou
18.Aale
19.Saadi
20.Deurali
21.Armala
22.Jowri
23.Bhat Gaun
24.Poudyal ghar
25.Lahchowk Gaun

FIGURE 4 - THE LEKH

The drawing of this map was a collaborative effort between a number of occupational caste men. The farthest point (1.) from the village (25.) is several days journey up into the forests of the Lekh. The circles represent landmarks, trail confluences, and resting places. Many of the names are indicative of the physical characteristics of the place; for example, Tindobate refers to the three roads which come together. Women are not familiar with these far-off areas of the Lekh.

baskets (**doko**)[35], rice storage baskets(**bhakari**) and umbrellas (**shyaku**)[36]. **Tite nigaalo** grows both on private land and in the Saadi area of the Lekh. It is a preferred type because of its multi-purpose nature and tasty shoots. The men reported that they care for **bari nigaalo** more carefully than Lekh **nigaalo**, due to the fact that it is on their own land. **Baans** and **nigaalo** which grow on **bari** land are both easy to look after and easy to harvest.

The age, as well as the type of **nigaalo**, is a determinant in what will be made. Newer, softer bamboo is used for umbrellas (**shyaku**) and mats (**gundri**)[37], and older, harder bamboo is used for making carrying baskets and flat, round trays used for cleaning rice and other grains (**namlo**). The roofs of cattle barns (**chitro**) are constructed out of mats woven from old **nigaalo**. As well as different types of carrying and storage baskets and umbrellas, bamboo is used to make larger rice storage containers (**kotho**), smaller baskets

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[35] Only men make **doko**, because both **nigaalo** and **baans** are involved in their construction. Although women cut **nigaalo**, only men cut **baans**. The explanation for this is that because **baans** is a large species and requires the use of an axe, women would find it to difficult to cut. But there are also cultural proscriptions which forbid women to cut **baans**. Women reported that if they cut this species they would not find a man to marry. If a married woman cuts **baans** it is believed that her ability to bear children will be lost and the health of her family will suffer. Proscriptions play a significant role in maintaining the status quo concerning the traditional gender-based division of labour.

[36] **Shyaku** are usually made by men, but I also observed women making them. A basket-like frame is woven together and then **katus** leaves are used to make the umbrella waterproof. The leaves are sewn together with long thin strips of **nigaalo**. The **shyaku** will last 4-5 years if it is dried out over the fire after it is used.

[37] **Gundri** are mats woven on a horizontal loom. It is most often women who weave these mats, but I observed both high caste and occupational caste men engaged in this activity also.

(**tunse**), oxen yokes (**damlo**), mattresses (**mandro**), and ropes. Different parts of the bamboo plant, as well as different species, are used for different purposes. Men reported that the top portion of the **nigaalo** is used for making carrying baskets. The middle portion is best for making umbrellas and carrying baskets. And the very tip portions of the **nigaalo** are left in the forest in piles to dry for 12-18 months and then collected for kindling.

Nigaalo is a good coppicer. It will regenerate no matter how it is cut, but growth is restricted if the men continually cut the same clump. During the months of Jeth and Asar the new **nigaalo** shoots appear. Hence, village men cut **nigaalo** in Baisakh, before the new shoots come out, and in Kartik-Mangsir, after the shoots have matured. The bamboo is cut approximately one foot from the ground to encourage the growth of new shoots.

Many of the Sarki men in Lahchowk are engaged in making the above "cottage industry" items. Villagers explained that the Sarki are the best with these materials because "they have been using nigaalo for a long time. It is their business, making baskets, mats, fences..." They are usually given the materials by other villagers and compensated with a meal for making baskets and mats. If they collect their own materials, they can sell their carrying baskets for about Rs.20 in the village.

Baans is the larger species of bamboo found around Lahchowk. It grows as large as any tree in the village, and Nepali villagers classify both **nigaalo** and **baans** as tree species. Men listed four types of **baans** which grown on **bari** land (**baans** does not grow in the forest). **Nigale baans** has characteristics of both **nigaalo** and **baans**, and could be either a cross or an intermediate type. **Gobi baans** is a narrow type of bamboo excellent for making flutes. **Dhanu baans** is primarily used for making carrying baskets and fences. **Tama baans** is a multi-purpose type used as food (shoots) and for making grain cleaning baskets. The main uses of **baans** are as water pipes, for grain cleaning baskets, carrying baskets, bed frames, chairs, tables, storage platforms for hay and squash, storage racks for corn (**suli**), rice storage baskets (**bharkari**), plow yokes (**damlo**), roofs for cattle stalls, and house beams.

Baans is said to be cut all year round, but the main months of cutting are from Baisakh through Asar, before the new shoots appear in Saun, and from Asoj to Kartik, after the **baans** has stopped shooting. **Baans**, like **nigaalo**, is cut 1-2 feet off the ground so that the shoots will regenerate. The men explained that the stump must be left untouched because **baans** regenerates from the roots.

5. Live fences

Men do most of the tree transplanting and fencing work in the village. Certain trees and shrubs are spaced so closely that they form hedges or fences. Although people prefer a solid wall around their property, live fences work almost as well and have other benefits. While many hedges found in the village consist of several species growing next to and on old stone walls and also independently, many of these plants have propagated themselves. Villagers explained that the criterion for a "live" fence is that all of the species within the fence have been planted.

Live fences demarcate property, help to protect home gardens from animals, and provide shade. They also serve as erosion control during the monsoon. In addition, they provide useful products such as materials for baskets and mats, fuel, fodder, fruit, and medicine. Villagers report that "live fences can grow easily and seldom need repair. They can later be used as firewood."

The best species for live fences and the ones most commonly used are **phaledo**, **khirro**, **suindi**, **sajiwan**, and **asare**. The village men gave numerous reasons for their preferences.

Suindi is effective for keeping both cattle and people out of fields as it is very thorny; it is only ever used in live fences. The inside portion of **suindi** is also used as medicine for sore throats, fevers, and **kufat**: the inner portion is cut out and eaten raw for this purpose. **Suindi** cannot be used as fuelwood as it is hollow, but it is believed to draw lightening away from the home thus protecting the occupants. It is also used for making traditional **madle** drums which are played at festivals and parties. **Sajiwan** was reported to make the best living fences because goats and other cattle cannot eat **sajiwan**: "sajiwan is best because no animals will eat it and it has a very strong stem." **Khirro** is a true multipurpose fence tree: the old trees are used as timber, and finally as fuelwood. The latex of **khirro** is harmful to humans and animals. When the drops come in contact with the skin, blisters form. **Phaledo** can also be utilized for firewood; goats eat the leaves but their thorny stems make them impassable. Most goat pens in the village are made out of **phaledo**. **Khirro** and **phaledo** - although used mainly for timber and fuelwood respectively -- are not planted on private land apart from in fences. Villagers also plant different fodder species, such as **badhar**, **berulo**, **lalupate**, and **chuletro**, inside stone walls.

All of the species are transplanted in the same manner; basically, "they are cut and stuck in the ground." Roots are not necessary. Once transplanted most of the species grow. The villagers transplant live hedge trees when there is no crop growing in the **bari** fields. Like their forefathers, they plant these live hedges for four months only, from Mangsir to Phalgun. Live fences establish well during these months when the soil is moist, but do not do well if planted later. During the rainy season the women cut the tall fences for fuelwood so that they will not shade the crops growing in the fields. This is generally women's only role in the life-cycle of a live fence.

6. Private trees

In Kakamega, Kenya, it was found that only male farmers planted and managed trees. Tree planting, according to the men, was done for a variety of purposes: poles or timber for construction, split wood for cask sale, wood for making charcoal as well as other products for use in rituals and religious ceremonies (Chavangi 1991). This list could have been given by any one of my Nepali informants. In both Kenya and Nepal, there is a distinct preference among men for exotic tree species which are regarded as a cash crop or as a form of investment. Women are expected to continue to collect firewood from the forest, despite that the fact that this natural resource is no longer easily available. Although fuelwood seems to be a by-product rather than the main purpose of propagating trees, in general villagers prefer to grow multi-purpose species. Various factors influence whether farmers plant trees and which trees they plant. Many people in the village plant trees, although it is often the richer farmers who plant, for they have more land and fewer household members. It is difficult for poorer villagers - who do not have enough land to grow crops to feed their families - to plant trees.

> The role of size of land holding is crucial, and must be considered in relation to ecological and socio-economic relationships. For example...a farmer with a relatively large land parcel probably has more area available for tree planting, depending on household size. Also, a larger holding may mean that the household has the extra wealth to be able to afford to plant trees on land that could be used for other shorter-term purposes (Brokensha and Castro 1984:15).

Locally initiated tree management strategies have seldom, if ever, attempted to reverse the process of deforestation.

Instead these practices have been aimed at keeping households supplied with the various outputs that trees provide. The central aim of planting trees has always been on the utility value of trees for particular households. Thus, these strategies are selective in the trees that are protected and maintained (Castro 1990). Overall, trees are planted more often on private land than on public land as a response to the degradation of forests on public lands (Carter and Gilmour 1989; Gilmour 1988; Messerschmidt 1984; Rusten 1989; Tamang 1990).

The choice of what to plant may be limited by the species locally available. Tree nurseries are far away and many villagers said that they feel intimidated and uneasy about taking trees from the nursery. Some people feel that the trees in nurseries belong to the government and that the government could, at any time, come to reclaim the trees from the villagers.

The intended use of the tree is the main determinant of species choice, however. Because it is mostly men that plant trees in Nepal, they prefer fodder species, timber species, and bamboo. "Site risk" - the risk of crop failure associated with specific sites - is another factor which influences which trees to grow. One of the main reasons given for not planting more trees on **bari** land is that tree shade effects crop growth. Shade is not the only negative effect of trees, however; several men reported that the rice and wheat they plant along the edges of fields do not grow well because water from trees drops down damaging the small plants. Certain trees are seen to be less damaging or more damaging. It is felt that **bhadhar** trees do not harm crop growth, whereas no crops will grow near bamboo clumps. Through years of trial and error and close observation, the men of the village have determined what trees can be planted without harming crops, and how close certain crops can be planted to certain trees.

Indigenous planting techniques include both propagation from seeds and vegetative methods. A description of the many criteria used by farmers in selecting suitable techniques and planting materials should be sufficient to dispel the notion that indigenous methods are either random or unsophisticated.

One of the propagation methods practiced by Thakuri Gaun men is "air layering". This technique is similar to the one described by Mathias-Mundy et al. (1990) for Indian farmers' propagation of mango trees. Air layering is a means of vegetative propagation of plants. It should not be confused with grafting, which is not practiced in Lahchowk as far as I could determine. With layering, a portion of bark is peeled off the trunk. Next, a mud and manure mixture is patted onto the peeled surface and the bark is replaced and tied to tree. In Saun-Bhadau the roots start to come out from the replaced bark. This portion is then cut off the original tree and transplanted into the ground. The men say that trees which are propagated and transplanted this way will grow faster and give fruit earlier, but they do not last as long and are not as hardy as trees grown from seed.

Tree-tending techniques such as coppicing, pollarding and pruning are an integral part of traditional arboriculture (Mathias-Mundy et al. 1990). Various direct and indirect benefits of these techniques, as reported by Thakuri Gaun men, include increased production of fuelwood, fodder, fruits and other products, and reduced shade. Coppicing involves cutting down the tree and allowing shoots to regrow from the stump. It produces more wood than does un-manipulated tree growth. Naturally occurring trees and shrubs are sometimes coppiced for fodder and other purposes. Pollarding is a special form of coppicing. The tree's crown is cut off so that new branches will grow from the top of the remaining stem. Pruning also involves cutting off branches and other parts of a tree.

Plant species are commonly transplanted because they are somehow useful for the cultivator. Although transplanting -

moving plants to a new location - seems to be widespread in indigenous culture, there are few descriptions of indigenous transplanting in the literature (see Mathias-Mundy et al. 1990). Both men and women in Thakuri Gaun are actively involved in transplanting seedlings from elsewhere onto their own home garden and **bari** land. Although women do transplant, it is the men who generally make decisions as to what trees will be planted and where. Men are primarily responsible for the care of the young trees.

A random sample of home garden and **bari** land shows a great variety in the sources and species of transplanted trees. Some of the commonly grown species on **bari** land are fruit trees such as **lapsi**, **nibua** (citrus fruit), and **aru** (peach). Timber species which are also used for fodder and firewood are also planted. **Chaap**, **chuletro**, **phaledo**, **simal**, **berulo**, **painyu**, **utis**, and **bamboo** are commonly planted species. Trees are bought from the nursery in Pokhara, dug up from beside trails and rivers, taken as cuttings from older trees, and transplanted from the forest. If transplanted trees do not survive, the farmers can almost always explain why: "The painyu and utis I planted are now dead due to improper pit depth"; "I think that I cut too many roots off when I was trying to get the seedling out of the ground."

Men's knowledge, like women's, is specialized. Men have different priorities concerning what species to plant and how to care for trees and harvest tree products; consequently, their knowledge differs from that of women. Different castes possess specialized knowledge of house construction, cottage industries, charcoal production and the fashioning of agricultural implements. Tree planting knowledge is fairly uniform among all men in the area. Knowledge in this domain is influenced by landholding size, household composition, and personal idiosyncrasy.

The main conclusion drawn from the data presented in this chapter is that a focus purely on women's knowledge is both limiting and potentially destructive. Village and household level economies depend on the labour and knowledge of both genders; the tendency in the West to dichotomize development efforts into those exclusively for women, and those for men, is unnatural. Indigenous knowledge encodes and structures the ways in which people perform their cultural roles, allocate their resources and deal with constraints in a decision-making process, and meet the needs of their families in a systematic fashion. Thinking about the total system of knowledge makes it obvious that a balanced analysis includes both genders.

CONCLUSION

This thesis has argued that involving local people in efforts to more sustainably manage the resources on which they depend is not just desirable, it is vital. An understanding of the dynamics of indigenous management practices and systems, and the involvement of knowledge-holders in the formal management of their own resources, cannot fail to benefit natural resource development efforts. Rural inhabitants possess vast and detailed knowledge of their forests and local environment. By exploring and learning to appreciate these systems of knowledge and explanation, we can begin to understand the problems and constraints facing villagers and the adjustments they have made to them.

Resource management and the systems of knowledge which support it arise out of social and historical contexts. An understanding of the local culture is essential to an understanding of the relationships between people and their natural resource base. It sometimes happens, however, that local institutions can produce practices that do not favour sustainability. "Institutions that regulate resource use may break down and limits of regeneration may be exceeded when people do not understand these limits or feel they have no alternative" (Uphoff 1992:3).

It is important to recognize that the current system operating in Thakuri Ban is not, historically, one that was designed to exclude the occupational castes. In the past, the system operated in a fluid manner, accommodating all users of the forest with no imposition of caste-based restrictions. Political consolidation of power over resources at the national level and the increase of the local population threw this system into disequilibrium and the system evolved, transformed itself, into one which operates on the basis of formal exclusion of those who have lower economic and social status. As a result of this factionalism which prevails in

Thakuri Gaun, many villagers are exploiting resources to their short-run advantage with little view to the future.

Inequity has necessitated diversity in exploitation patterns and within knowledge systems. What this tells us, as anthropologists, is both interesting and illuminating. A culture is not homogeneous; it is not made up of one way of knowing, or viewing the world, or interacting with the natural environment. And cultural knowledge is not just something that a child acquires first from its parents, and then from its teachers and peers. Each individual within a culture possesses a system of knowledge which is unique, largely because each individual belongs to a number of different groups within society: gender-based affiliations, age-associations, caste groupings, economic strata, etc. Where there is common association in several of these groups, much knowledge will be common between two or three or more people. Where there are few or no similarities, knowledge will vary greatly and there will be relatively little overlap.

These groupings of knowledge holders within a community are somewhat analogous to schools. Each "school" within a culture teaches a different part of the culture to the individual. A school for the poor, for example, would impart information on the harvesting and use of forest foods, knowledge which is not needed or used by wealthier community members. A Sarki man would be schooled in the art of fashioning bamboo into different products which could be sold for a profit to other villagers. Membership in these informal groupings determines what knowledge is necessary; the fewer resources one has, and the lower the social status, the more one needs to know about the forest in order to survive. When specific knowledge is no longer necessary for survival, it is often lost.

Information gathered from women can give insight into the knowledge systems of women, but not necessarily men; information received from occupational caste members is a representation of their unique knowledge system, but it tells one little about the knowledge of the higher castes. The recognition that no one individual has attended all of their culture's schools should be a caution not to rely on the knowledge or information of any one informant. It should also caution against the reliance on the knowledge or information of any one "interest group".

Based on my research in Thakuri Gaun, I can state unequivocally that different types, or categories, of people possess different kinds and amounts of knowledge depending on their life experience. Domains of knowledge and of knowledge holders are not random or idiosyncratic; they are influenced by gender, caste, and class. These are by no means the only factors that influence indigenous forest knowledge, but they were the most prominent ones in my research area.

"This diversity in the level [and kind] of knowledge suggests that it is not enough to just talk to a small group of informants or only the group's leader" (Norem et al. 1988:18). If our aim is to gain a fuller understanding of an entire culture we must acknowledge that a system functions only through the combination of all of these complementary domains of knowledge.

The implications of separate and unique domains of knowledge go even further. Indigenous knowledge which is specific to a sub-group within a culture is a possible explanation for the emergence of sub-cultural groups. Separate knowledge leads to and reinforces an ideology of segregation. Groups begin to find their identity within sub-cultural, rather than cultural, systems of knowing. Caste divisions, supposedly being eroded by the new social order which encourages economic parity and political opportunity for all, are indeed also being reinforced by caste-based systems of knowledge and the reference behaviour which this engenders among members of a disadvantaged group. One might go even further and suggest that caste is a product of the development of stratified systems based on knowledge. The origins of caste have long been debated, but are, unfortunately, beyond the scope of this thesis.

Cross-cutting caste-based systems of knowing, and adding even more diversity, are gender-based knowledge domains. Diversity in gender-based knowledge systems is highly adaptive. The unique knowledge that women possess has not arisen out of patriarchal structures within society; it has nothing to do with an ideology of female oppression. Rather, it is both necessary and complementary to male domains of knowledge. In the present case, diversity within gender-based systems of knowledge seems to be associated with inequity and inequality; however, it is not clear whether there is any causality in this relationship. The fact that in some other cultures, gender-based systems of knowledge, associated with division of labour, occur in the absence of unequal access to resources would seem to suggest that the relationship between knowledge, division of labour, and social stratification is not a simple one.

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APPENDIX A: Glossary of English and Nepali Terms

English Terms

Access user: Access users of a forest area are people who have no bijan or sanat in that forest area. They have no legal rights as members of a "user group," make no decisions concerning forest management and have no responsibility to abide by the rules laid out by the samiti.

Caste: The caste system is a rigid stratification of society, according to the division of labour and/or occupation, along a vertical axis. The Brahmin Caste is at the top followed by Chhetri and other castes. Upward mobility from lower to higher caste is impossible but downward mobility is possible. Each stratum in the system is a caste.

Common Property: Property which specific people have a duty to conserve (which is often ignored), in return for specific access for utilization purposes.

Communal Forestry: Forest based activities initiated by a group of people within the community who are included in the activity in the basis of one or more criteria. To the exclusion of others, the group members, in theory, undertake all costs, risks, responsibilities and also reap all benefits.

Community Forestry: Forest based activities initiated by the community, who undertake all costs, risks, responsibilities and also reap all the benefits.

De facto: In fact, reality or actuality; with or without legal sanction.

De jure: By right, legally, according to the law.

Distribution: The practice of sharing/allocating forests and forest products, using a set of criteria, among users and/or user groups.

Ethnic Groups: Groups, tribes, clans and so on who do not historically belong to the Hindu caste system. Examples are the Gurung, Tamang, Rai, Limbu, Tharu, and Chepang.

Forest Committee: A group of people elected/selected by the users to manage community forests.

Forest management: A set of practices regularly carried out by people who conform to institutional/organizational arrangements.

Forest management practices: Practices that include harvesting, protection, distribution and planting of forests and their products. These may be carried out informally.

Harvesting: The practice of cutting and collecting various forest products by users and/or user groups.

Indigenous: Generated primarily by internal initiative within a local community rather than by external intervention by government, development agencies, etc. These may be of recent origin.

Land-Poor: Relating to an individual/household who own little or no land. This does not mean that the individual/household is cash poor: the individual or household may be land poor but cash rich.

Land-Rich: Relating to an individual/household who own sufficient land and/or have comparatively more land than others in the village community. This does not necessarily mean that the individual/household is rich in terms of cash.

Occupational Castes: A synonym for the lowest caste groups in the hierarchy of the Hindu caste system. Occupational castes consist of people whose occupation involves manual labour, such as blacksmiths, carpenters, tailors, shoemakers, and so on.

Owner user: Owner users of a forest are those who have recognized rights (at the village level, the district level or the national level) to manage and utilize a forest area. They possess sanat and/or bijan in the forest area, are permitted to sit on the samiti and make decisions concerning management, and are obliged to abide by the rules of the samiti.

Private Forest: Forests that exist on private rather than public land.

Private Land: Land which is owned by an individual/household and over which the individual/household has complete control.

Protection: The controlled usage of an area of forest by a given group who have assumed responsibility for it, regardless of the legal ownership of that forest area.

Public Forest: Forests that exist on public land. The Department of Forests has the sole legal responsibility for their control, usage and management.

Public Land: Land that is owned by the Government. The local community legally has no responsibility for control, usage or management.

Traditional: Opinion, belief or custom, generally based on continuous usage or accumulated experience, handed down from ancestors orally or by practice. Does not imply local origin.

User Groups: Users (individual/households) who are more or less recognized and accepted as members in flexible groups who have rights of varying degrees to control and use various patches of forest within a definite geographical area.

User Rights: Locally recognized and accepted claims, both traditional and non-traditional, of control and utilization of various patches of forests and their products. Claims may be extra-legal.

Users: Individuals/households whose survival is wholly or partially dependent upon access to forests and forest products and their utilization. These "users" may be either de facto or de jure.

Nepali Terms

Adhiya: Short-term economic arrangement between villagers where a worker does field labour for a land owner and the owner repays the worker with rice.

Adukshya: The elected head of a forest committee.

Bhainsi: Water buffalo; one of the main types of livestock in the terai and mid hills of Nepal. Used for traction, meat, and milk.

Balam: The fence around a home garden.

Ban: Forest.

Bari: Dry land which is not irrigated and on which corn, potatoes, and other vegetable crops are grown. In the Lahchowk area, bari land is most often close to or surrounding the household which owns it.

Besan: Gram (a South Asian pulse) flour. Gram is also known botanically as Madras Grass or Horse Grass.

Bhari: A backload of fuelwood, weighing about 25-40 kg, depending on the type of tree species, the type of fuelwood (i.e. slit wood or dry twigs), whether the wood is dry or green, and the capacity of the person carrying it.

Bhui ghaas: Fodder taken from the ground, most usually grasses and small plants.

Bijan: Forest land which is not officially registered with the District Forest Office but which is locally recognized as being "owned" by an individual or household.

Bikas: Development.

Boos: Sawdust.

Chamal: Uncooked rice. The traditional payment to the forest watchman.

Chiso: Refers to the attributes/properties of fodder under local classification schemes as "cool" fodder.

Chulo: Enclosed stove, similar to an oven where the wood is pushed in through the front and the pots are place on the holes on the top of the stove.

Dahi: Yogurt.

Dal bhat tarkari: Traditional Nepali meal, usually eaten morning and night, which consists of rice, lentil broth, and whatever vegetable is in season.

Dale ghaas: Fodder taken from trees.

Damlo/Juwa: Oxen plow yoke.

Daura: Fuelwood.

Doko: A woven bamboo basket in which fuelwood is transported.

Gaun: Refers to either an entire village if the village is small, or to a neighbourhood within a larger community.

Gaun sallah: Village dialogue. A formal gathering together of villagers to discuss community matters.

Ghaas: Fodder.

Ghui: Clarified butter.

Godne: Selective removal inferior species from a forest area.

Gundri: Sitting and sleeping mat woven out of bamboo. Food stuff is also spread on this type of mat to dry out in the sun.

Hal goru: A measurement of land used in Lahchowk. One hal goru - sometimes referred to simply as "one hal" - is the amount of land which can be plowed by one oxen in one day.

Halo: Plow.

Hansi/Hansiya: Sickle-like knife used in chopping wood, fashioning bamboo, and chopping vegetables, fruit, and meat.

Heralu: Forest watchman or guard.

Jat: Caste.

Jinga: Small sticks or pieces of firewood. Often used as kindling.

Joreebuthi: Local term for herbal medicine.

Khaja: Mid-afternoon snack of milk tea and sometimes yogurt and beaten rice, or popcorn and roasted beans.

Khar Bari: Area from which fodder and thatch grass can be harvested. Often found on hilly and barren areas for the purpose of erosion control. Can be private or communal.

Khet: Wet-land or irrigated farm land, most often terraced, in the mid-hills of Nepal. The main khet crops are rice and finger millet.

Khole: Cooked fodder supplement.

Khundo: Livestock mash, most often fed in the winter months.

Kotho/Barkari: Larger rice storage basket.

Kufat: Local term for "white tongue," a symptom which indicates a certain type of stomach malady.

Kuta goru: An indigenous system by which a villager can own a leg (kuta) or legs of an oxen (goru). For example, one villager may own 3/4 kuta goru, which means he owns 3 of an oxen's four legs and is entitled to use the animal for 3/4 of the time and take 3/4 of the products of that animal. A neighbour or friend will own the other 1 leg.

Laharo/Lahara: Vines.

Maas: Black lentils.

Madle: Traditional Nepali drum.

Mana: Local measurement; approximately 1 pound.

Mandro: Mattress for a bed.

Nal, Paral: Crop residues, where nal is the residue of millet and paral of rice residues.

Namlo: Flat, round, bamboo tray which is used by village women to separate rice and other grain from husks and residues.

Niji ban: Private forest.

Obano: Warm and dry fodder; polar opposite of chiso.

Odan: Metal tri-pod stove common in the research area.

Pani calne: Term used to refer to "clean" castes, or the higher castes. In Thakuri Gaun, this group is represented by the Thakuri; although Newar, Gurung, and Thapa Magar could also be placed in this grouping according to local ideology and practice.

Pani necalne: "won't or don't accept water". Term used in reference to uncleaness or pollutedness of food and water touched by the lower or occupational castes. Pani necalne castes in Thakuri Gaun include the Sarki, Damai and Sunar.

Pathi: 1 pathi is approximately 4 kilograms of grain measured in what is known as a "pathi pot".

Phokse: Hollow trees where illegally cut forest products are hidden.

Raksi: Local home-brewed millet alcohol (absolutely deadly!).

Ropani: One ropani is approximately 500 square meters. It is a common land measurement used in Nepal.

Roti: Flat bread.

Samajik/Samudiyak ban: Community forest.

Samiti: Forest committee which represents the user group of a certain forest area.

Sanat: Forest land which is officially registered with the District Forest Office and legally owned by individuals, households, or community groups.

Shyaku: Umbrella made of bamboo and katus (or other) leaves.

Sita: Kindling. Most often used to refer to bamboo sticks used to start a fire.

Tunse: Small storage basket.

APPENDIX B: Seasonality and Location of Daura Species

DATE: 28th Nov
CASTE: Magar
NUMBER OF INFORMANTS: 3F
TB = Thakuri Ban L = Lekh Ban PB = Poudyal Ban[38]

Months Collected:	Asar-Asoj			Kartik-Magh			Phalgun-Jeth		
Forest Area:	TB	L	PB	TB	L	PB	TB	L	PB
Species: Katus	*		*	*		*	*		*
Mahua	*		*	*		*	*		*
Chilaune	*		*	*		*	*		*
Timur					*			*	
Phalant					*			*	
Muni	*		*	*			*	*	

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[38] There are several other communal, caste-based forests surrounding Lahchowk that are regularly or occasionally utilized by the residents of Thakuri Gaun: villagers of Lahchowk go to forest areas managed by other villages; some of the occupational castes within Thakuri Gaun regularly go to Poudyal Ban, rather than Thakuri Ban; there are also small areas of forest on the outer fringes of Thakuri Ban which are used and managed by mixed caste groupings; and finally, there is the government owned Lekh forest in the high hills above Lahchowk. For a fuller description of these forest areas and how they are utilized by Thakuri Ban villagers, the reader is referred to Appendix E.

DATE: 22nd Jan
CASTE: Brahmin
NUMBER OF INFORMANTS: 4F
TB = Thakuri Ban L = Lekh Ban O = Other Ban
GB = Ghumse Ban NB= Nakale Ban KP= Kuwa Pani Ban

Months Collected:	Asar-Asoj			Kartik-Magh			Phalgun-Jeth		
Forest Area:	TB	L	O	TB	L	O	TB	L	O
Species: Katus				*			*		
Bilowne		*	GB		*			*	
Muni			GB			GB			
Machaino			GB			GB			
Chilaune	*		NB KP	*		NB	*		

DATE: 23rd Jan
CASTE: Sarki
NUMBER OF INFORMANTS: 5F
TB = Thakuri Ban L = Lekh Ban PB = Poudyal Ban

Months Collected:	Asar-Asoj			Kartik-Magh			Phalgun-Jeth		
Forest Area:	TB	L	PB	TB	L	PB	TB	L	PB
Species:Bilaune	*	*	*	*	*	*	*	*	*
Katus	*		*	*		*	*		*
Utis	*	*		*	*		*	*	
Phalant		*			*			*	
Ainselu	*	*		*	*		*	*	
Chilaune	*		*	*		*	*		*

DATE: 30th Nov
CASTE: Sunar
NUMBER OF INFORMANTS: 5F & 5M
TB = Thakuri Ban L = Lekh Ban O = Other Ban

Months Collected:	Asar-Asoj			Kartik-Magh			Phalgun-Jeth		
Forest Area:	TB	L	O	TB	L	O	TB	L	O
Species:Dabdabe					*			*	
Simal	*		*	*			*		*
Khirro	*		*	*			*		*
Katus	*		*	*			*		
Utis					*				
Phalant					*			*	
Chilaune	*			*			*		

APPENDIX C: Species Identification and Description

DATE: 27th Nov CASTE: Sunar
NUMBER OF INFORMANTS:5F SPECIES IDENTIFIED: 22/22

Species	Uses	Collecting season
Angeri	daura; fodder for cows	Mangsir,Poush
Basuli	daura	-
Bikh	poison	-
Bimiro	daura; fruit eaten	Mangsir,Poush
Chilaune	multipurpose tree	Whole year
Chutro	daura; fodder for cows	Jeth
Chile	no use	-
Kapase	daura; medicine	Whole year
Dhairo	daura; fodder; used for brewing	"
Dhurseli	daura; leaves used for ripening banana	"
Datiwan	brushing teeth	"
Dhobini	fodder	-
Dahijalo	eat fruit; root is used as medicine	Whole year
Goltapre	medicine for sore throat	
Katus	fruit; daura; fodder	Asoj
Malato	daura	-
Mahua	daura	Whole year
Newara	fodder	Poush,Magh
Phultis	daura	Whole year
Rudhilo	daura; root used for abortions	"
Ruktachandan	daura; timber; used by women for puja	"
Tanki	daura; fodder	Mangsir,Poush

DATE: 30th Nov CASTE: Sunar
NUMBER OF INFORMANTS:9F & 7M SPECIES IDENTIFIED:23/23

Species	Uses	Collecting season
Angeri	daura; fodder for cows; fruit	Mangsir, Poush, Saun
Ban kapase (bheda sisnoo)	fibers used to make thread	-
Bimiro	daura; fruit	Asoj, Kartik (fruit ripe)
Bikh	poison; medicine leaches & skin	-
Chaulane	daura	Whole year
Chilaune	multipurpose tree	Whole year
Chutro	daura; fodder for cows; fruit	Jeth, Baisakh
Dhairo	daura; fodder; used for brewing; dysentery medicine	-
Dhurseli	daura; medicine; ripens bananas	Whole year
Datiwan	brushing teeth	"
Dhobini	grass; fruit eaten for sore throats	Jeth
Dahijalo	eat fruit and root; medicine for throat	Whole year
Goltapre	medicine for soar throat	
Kalo Bilowne	daura; goat fodder	"
Katus	fruit; daura; fodder	Asoj
Mahua	daura	Whole year
Newara/ Newaro	fodder; leach medicine	Poush, Magh
Phultis	daura	Whole year
Rogini	daura	"
Rudhilo	daura; goat fodder	"
Ruktachandan	daura and timber	"
Tanki	daura and fodder	Mangsir, Poush
Tarul	tuber eaten by people	Poush, Magh

DATE: 24th Jan CASTE: Sarki
NUMBER OF INFORMANTS:4F SPECIES IDENTIFIED: 22/22

Species	Uses	Collecting season
Ainselu	daura; fruit; burn & dysentery medicine	Baisakh,Jeth, Chait
Ankhle	fodder	Whole year
Batule pate	medicine for people and animals	"
Buta Ghans	fodder	
Charchare ko lahara	fodder; daura;	"
Chilaune	fodder; daura; bark used as pig medicine	"
Chiple	goat fodder; daura; mix in roti	"
Dudhe laharo	fodder	"
Dhurseli	daura; goat fodder; kufat & cold medicine	"
Gai Tihara	fodder; medicine for sinus infection	"
Gurans	flower is medicine for throat & choking	"
Katus	fever medicine made of bark; fodder; daura	"
Kubidhaino	fodder	"
Muni	daura; fodder	"
Musure katus	fodder; daura; leaves for shyaku	"
Pati	daura; root used as worm medicine	"
Phusre	fodder	Whole year
Pipal pate	fodder	"
Pyauli	fodder; medicine for sores	Chait, Baisakh
Rudhilo	goat fodder; kufat medicine	"
Tarul	leaves for fodder; root eaten	Mangsir,Poush
Tite	fodder	Whole year

DATE: 23rd Jan CASTE: Sarki
NUMBER OF INFORMANTS:3F & 3M SPECIES IDENTIFIED: 22/23

Species	Uses	Collecting season
Ainselu	daura; fruit; burn & dysentery medicine	Baisakh,Jeth
Ankhle Angeri	fodder	Asoj,Magh
Batuli pate	medicine for loss of blood; fodder; basket ties	Whole year
Charchare	fodder; daura; fruit	Mangsir,Poush
Chilaune	multipurpose tree	Whole year
Chiple	goat fodder; daura; mix in roti	Mangsir,Baisakh
Dalchini/ Kubidhaino	spice; medicine	Mangsir,Poush
Dhurseli	daura; goat fodder; kufat medicine	"
Gurans	medicine for sore throat & choking	"
Kalo bilaune	daura	Mangsir,Magh
Kalo lahara	fodder; ropes & ties	Whole year
Katus	fruit; daura; fodder; timber; leaves for shyaku	"
Kutmiro	fodder; daura	"
Muni	daura; fodder	"
Musure katus	fodder; daura	"
Pati	goat fodder; daura	"
Pipal pate	fodder	"
Pyauli	fodder	"
Phalant	daura; fodder; timber	Mangsir
Rudhilo	goat fodder; daura; medicine for kufat	Whole year
Tarul	leaves for fodder; root eaten	"
Tihare phul/ Gai Tihare	fodder; daura	"

DATE: 24th Jan CASTE: Damai
NUMBER OF INFORMANTS:5F SPECIES IDENTIFIED: 22/23

Species	Uses	Collecting season
Ainselu	daur;, medicine for dysentery and burns	Baisakh,Jeth
Ankhle Angeri	fodder	Asoj,Magh
Batuli pate	medicine for loss of blood	Whole year
Charchare	fodder; fruit	Mangsir,Poush
Chilaune	multipurpose tree	Whole year
Chiple	fodder; daura; mix in food	Mangsir,Baisakh
Chutro	daura; fodder	Jeth
Dalchini/ Kubidhaino	spice; medicine	Mangsir,Poush
Dhurseli	daura; kufat medicine	"
Dudhe lahara	daura; fodder	"
Dhurseli	daura; used for ripening banana	"
Hathi pau	fodder	Whole year
Gurans	medicine for sore throat & choking	Magh,Chait
Jingano	daura; fodder	Whole year
Katus	fruit; daura; fodder	Asoj
Muni	daura; fodder	Whole year
Pati	medicine to prevent leaches	"
Pipal pate lahara	fodder	Mangsir,Phalgun
Pyauli	fodder; medicine for sore throat	Magh,Baisakh
Rudhilo	fodder; root used as medicine	Whole year
Tihare phul	fodder; medicine for sinus infection	"
Tarul	food; fodder	Asoj,Magh

DATE: 27th Nov CASTE: Gurung
NUMBER OF INFORMANTS:5F SPECIES IDENTIFIED: 20/22

Species	Uses	Lopping season
Angeri	daura; fodder for goats	Whole year
Tin pate Basuri	"daura of poor people"	"
Bikokarra	no use	-
Bimiro	daura; fruit	Mangsir,Poush
Chilaune	daura; fodder; timber	Whole year
Chutro	daura; fodder for cows; eat seed	Jeth,Baisakh
Dahijalo	mix with ainselu & rudhilo for kufat	Whole year
Datiwan	brushing teeth	"
Dhairo	daura; fodder; used for brewing	"
Dhurseli	daura; fodder	"
Dhobini	fodder	"
Kapase	daura; medicine	"
Katus	fruit; daura; fodder	Asoj
Malato/ Molata	daura; fodder	Whole year
Mahua	daura	"
Timilo/ Tinilo	fodder; winter daura	Poush,Magh
Phultis	daura; fodder	Whole year
Rudhilo	daura; medicine	"
Ruktachandan	daura; timber	"
Tanki	daura; fodder	"

DATE: 22nd Jan CASTE: Brahmin
NUMBER OF INFORMANTS:4F & 1M SPECIED IDENTIFIED: 19/23

Species	Uses	Lopping season
Ainselu	daura; medicine for dysentery and burns	Baisakh,Jeth
Batuli pate	medicine for loss of blood; fodder	Whole year
Charchare/ Geda ko laharo	fodder	Mangsir,Poush
Chilaune	daura; timber; fodder	Chait, Baisakh
Chutro	daura; fruit	Jeth
Chiple	daura; mix in roti	Mangsir,Baisakh
Dudhe lahara	daura; fodder	"
Dhurseli	daura; used for ripening banana	Magh,Baisakh
Hade unyo	early days used for animal pens & bedding	Whole year
Gurans	medicine for sore throat & choking; daura	Magh,Chait
Katere	fodder	Whole year
Katus	fruit; daura; fodder	Mangsir,Magh
Muni	daura; fodder	Whole year
Phusre kanda	fodder	Magh,Baisakh
Pipal pate lahara	fodder; leaf plates for puja & wedding	Mangsir,Phalgun
Pyauli	fodder; medicine for sore throat	Magh,Baisakh
Rudhilo	fodder; used as medicine	Whole year
Rate kangiyo	fodder	"
Tarul	fruit; fodder	Asoj,Magh

DATE: 28th Nov CASTE: Thakuri
NUMBER OF INFORMANTS:7F SPECIES IDENTIFIED: 20/23

Species	Uses	Lopping season
Angeri	daura; goat fodder; fruit	Mangsir,Poush
Basuli	no use known	Whole year
Bikh	poison	Whole year
Bimiro	daura; eat fruit	Mangsir,Poush
Chile	no use	-
Chilaune	multipurpose tree	Whole year
Chutro	daura; fodder for cows; medicine	Jeth
Kapase	daura; medicine for kufat; throat & heart burn	Whole year
Dhairo	daura; goat fodder	"
Dhurseli	daura; used for ripening banana	Mangsir,Poush
Datiwan	brushing teeth during Tij	"
Dhobini	fodder	Whole year
Dahijalo	eat fruit; root is used as medicine for kufat & typhoid	"
Katus	fruit; daura; fodder	Asoj
Malato	daura	Mangsir,Poush
Mahua	daura	Whole year
Phultis	daura; fodder	"
Rudhilo	daura; medicine for kufat & typhoid	"
Ruktachandan	daura; timber	"
Tanki	daura; fodder	Jeth

Note:- 13/23 species were identified by an all-male group of Thakuri.

DATE: 30th Nov   CASTE: Thakuri
NUMBER OF INFORMANTS:4F & 3M   SPECIES IDENTIFIED: 19/22

Species	Uses	Lopping season
Angeri	daura; fodder fruit	Mangsir,Poush
Bi ko kanda	soap for clothes; leach medicine	
Bimiro	daura; eat fruit	Mangsir,Poush
Chilaune	daura; timber	Whole year
Chutro	daura; goat fodder; fruit	Jeth
Kapase/ Suryamandal	daura; medicine for stomach and back aches	Whole year
Dhairo	daura; Sarki use for dying skins	"
Dhurseli	goat fodder	Mangsir,Poush
Datiwan	brushing teeth during Tij	"
Dhobini	goat fodder; sore throat medicine	Whole year
Dahijalo	eat white fruit	Jeth
Katus	multipurpose tree	Asoj
Malato	daura	Mangsir,Poush
Mahua	daura	Whole year
Phultis	goat fodder	"
Rudhilo	goat fodder	"
Ruktachandan	daura; timber	"
Tanki	cattle fodder	Jeth
Tarul	vines for cattle fodder; root eaten	Mangsir,Poush

APPENDIX D: Non-visual Recall of Daura Species

CASTE: Sunar

T=tree; SH=shrub; S=smoky; SL=smokeless
L=plentiful in Lekh; TB=plentiful in Thakuri Ban
l=sparse in Lekh; tb=sparse in Thakuri Ban

Species	Location	Type	Uses	Property
chaap	L	T	timber also	SL
gunowne	L	SH		SL
dabdabe	L	SH	fodder also	S
kaulo	L	SH	fodder also	S
phalant	L	SH	fodder also	S
ruktachandan	L	T	red sandlewood	SL
guiali	L	T	non-preferred daura	S
bakimlo	L	SH	non-preferred daura	S
balo	TB L	SH	non-preferred daura	S
chilaune	TB	T		SL
phultise	L	SH		SL
kubidhaino	L	SH	seed eaten	SL
kafal	TB	SH	fruit eaten	SL
ainselu	TB L	SH	fruit eaten; medicine	SL
chutro	TB L	SH	seed eaten	SL
katus	TB l	T	leaves used for animal bedding; acorn eaten; available during Asoj	SL
jingano	L	T	small tree cut as daura	SL
utis	TB l	T	found also in plantation	SL
towne	TB	T		SL
gurans	L	T	rhododendron; flower has medicinal qualities	SL
simal			non-preferred daura	S
falaydo			non-preferred	S
khirro			non-preferred; smoke very painful to eyes	S
osaro			non-preferred	S
dulsilo		T	only daura tree that is not used as fodder also	S
bilowne	L	SH		SL
muni	TB L	SH	cut green for daura	SL
malo	TB L	SH	fodder also	SL

CASTE: Sarki L=plentiful in Lekh; PB=plentiful in Poudyal Ban
l=sparse in Lekh; pb=sparse in Poudyal Ban

Species	Location	Characteristics	Other uses
utis	PB l	grows primarily in plantation	timber
kubidhaino	L PB		eat red seed
bakimlo	L PB	smokeless; good daura	
nigaalo		smokeless; easy to carry; quick burning	
chuletro		light; burns quickly	
sil timmur	PB l tb	burns quickly; considered good daura despite smoke	medicinal
phultise	L PB	slow burn; non-preferred	
bilowne	L PB	very smoky; non-preferred	
mahua		burns slowly; very smoky; not a preferred daura	
ainselu	PB L		fruit
guiali	PB		fruit
machaino	PB	smokeless; light; quick burning	"alchoholic" fruit
malo	L PB	preferred daura	fruit
chutro	PB l	very little smoke; easy to carry; quick burning	fruit
katus	PB	burns well green; prepares food quickly; retains heat and is smokeless; easy to find and carry; coal good for Sunar.	good timber, ash good detergent, a good fertilizer. Fruit
kafal	PB	must be dry to give good flame	
malaydo		good daura if dry	
dobine	PB	when the species is very branchy, used as daura	primarily a fodder
muni	L PB	small branches collected as daura	mainly a fodder
karu	PB	shrub; collect twigs	fodder
jingano	PB	keeps heat; burns quickly; prepares food quickly; little smoke	main fodder species
chilaune	PB	slow burning; very good daura; easy to find and relatively smokeless; good flame when wood is green; good coal for smithing.	timber
gurans	L pb	preferred daura	
towne	pb	slow burning and smokeless	
kaulo	PB	good daura	fodder
phalant	L pb	easy to carry; burns fast	multipurpose
chaap	L	slightly smoky; preferred	multipurpose

CASTE: Damai L=plentiful in Lekh; PB=plentiful in Poudyal Ban
l=sparse in Lekh; pb=sparse in Poudyal Ban

Species	Location	Characteristics	Other uses
utis		very good flame; preferred plantation	
okar	PB	good daura	nuts are eaten
bilowne	L	good daura; cut when green	
guiali	PB	good daura	multipurpose
machaino	L	good daura; cut when green	
daraykanda	L PB	climber	fodder
malo	L	good daura; cut when green	
chutro	L	daura only	
falaydo	PB	non-preferred	
katus	PB	good flame; lasts a long time; cut all year round; preferred daura	eat nuts
dhairo	PB	small branches cut when green	
arupate	L		
towne	L	good daura	
dabdabe	L	preferred daura	
khirro	PB	hard to carry but burns well and is smokeless	
dobine	PB	when the species is very branchy, used as daura	primarily a fodder
muni	PB	small branches cut when green	
kavro	PB	shrub; cut green	fodder
jingano	L	keeps heat; burns quickly; prepares food quickly; little smoke	main fodder species
chilaune	PB	slow burning; very good daura; easy to find and relatively smokeless	
gurans	L	preferred daura; long burning; good flame	fruit
kaulo	PB	good daura; cut green	fodder
phalant	L pb	hard to carry; burns well and is smokeless	fodder
simal	PB	smoky; non-preferred	

CASTE: Newar

Species	Characteristics	Other uses
malo	one of the best fruit trees for daura	seed eaten
dhairo	preferred daura	fodder
phalant	preferred daura	fodder
angeri	shrub; burns well and is smokeless	
muni	non-preferred but often burned	fodder
gurans	burns quickly and cooks quickly; especially good green	
jingano	fast burning; with less daura more meals are cooked; found in Lekh	fodder
mahua	preferred; fast burning; best if green	
dabdabe	fast burning; cooks much food with little wood; good daura, especially if green; only in Lekh	
chilaune	burns fast wet or dry; little needed to cook much food; smokeless	new leaves fed as fodder
katus	preferred; smokeless	fodder and nuts

CASTE: Thakuri L=plentiful in Lekh; TB=plentiful in Thakuri Ban
l=sparse in Lekh; tb=sparse in Thakuri Ban

Species	Location	Characteristics
utis	TB	preferred daura; light and easy to carry
siris	L	daura
bakimlo	L PB	tree which has taken on a broad, shrub-like appearance due to heavy lopping; branches break off easily; light to carry and easy to find but does not burn well so is a "filler" fuel only
sisoo	L	
phultis	L	average daura
bilowne	L TB	good daura; branchy, used to hide green wood under
mahua	TB	light to carry but very smoky due to bark; not a preferred daura
ainselu	TB	cut green any time of year; also used to hide green wood under
simal		not a preferred daura
phalant	L	burns well but heavy to carry; fodder also; preferred daura
moheeneekara	TB	shrub; thorny branches used for daura
chutro	L TB	fuelwood and fodder
katus	TB	most preferred daura; fodder; edible seed; only burns well if dry; holds heat and does not extinguish easily; smokeless; good coal
chaap	L	preferred daura species; also used for timber
daraykara	L	
muni	L TB	easy to find and light to carry but burns poorly; not a good daura
jingano	TB	burns quickly and cooks food quickly; especially good if green, but old dead trees are lighter to carry than young ones
chilaune	TB	most preferred daura; only burned dry; light to carry and smokeless; quick burning with excellent heat retention in coals; cooks much food
gurans	L	preferred daura
towne	L	good daura when dry
dabdabe	L	preferred daura species
ruktachandan	L	heavy but burns well; old dead trees most often lopped

APPENDIX E: Forest Areas

Ghumse Ban: - Twenty-two years ago some Thakuri Gaun **bijan** holders sold part of their shares in Thakuri Ban to Brahmin from wards 6 and 7. As a result, eight Brahmin and five Thakuri households share a piece of forest now known as Ghumse Ban. Ghumse Ban lies between Poudyal Ban and Reban Ban.

At the time, the land was not heavily forested and the trees that were there were very young. So the share holders decided to plant more trees and different species. As well as the 7 or 8 natural species, Ghumse Ban now includes **salla**, **chaap**, and **utis**.

The owner users of Ghumse Ban used to pay a watchman under the **mana-pathi** system, then they converted to cash and each household would pay Rs.10 every four months. Two years ago, however, they ended the watchman system, as one of the user household's fields are near enough to the forest for him to watch for illegal cutting. This protection method is still in place today.

The management of Ghumse Ban is such that green shrubs, but not green trees, may be cut. User households travel to the Lekh if they need green wood.

Kandeni Ban: - This is the boundary of Thakuri Ban and the Lekh forest area. The owners of this forest are Thakuri and the main users are Thakuri, Chhetri and Gurung of ward nos. 2 and 4.

Lekh: - The large area of government forest far above Lahchowk is known by the villagers as the Lekh. Exploitation of government resources for cutting firewood and timber is prohibited by law except by official permit applied for at the District Forest Office. In practice, villagers make extensive use of the Lekh and considerable illegal cutting is common in the hills. Balla et al. (1990) suggest that illegal cutting has resulted in severe reduction of forest resources in recent years, which in turn has lead to diminished access and great distance and time necessary for producers to find, cut and transport wood.

The upper part of the Lekh is called Bukini. This is where the shepherds graze their flocks in the summer and where much of the herbal medicine used in the village is found. Other commonly used areas of the Lekh are: Chichimle, Baitum, Armala, Saadi, Deurali, Aale and Gahunt pokhari. The main forest areas and their users are listed below:

Main Users by Caste	Forest Areas Used
Thakuri, Sunar, Sarki	Pohaikum, Aale, Gahunt, Pakho, Chichimle, Chihan Danda, Deurali.
Brahmin, Sarki, Damai, Thakuri (wards 1,3,4,5,7)	Aale, Baitum, Kaldhunga
Brahmin, Damai (wards 4, 5,6,7)	Lekh area above Reban

Lahchowk villagers reported that they try to avoid going to the Lekh because they are stopped and harassed by the inhabitants of Gahchowk who claim that the Lekh area is part of their community forest. The villagers of Reban seldom utilize the Lekh. The main Lekh users are the Lahchowk and Gahchowk people. Management of the Lekh is divided between Lahchowk, Reban, and Gahchowk, with each village occasionally sending a watchman to patrol the forest during the busiest months of cutting. Although the villagers say that they are afraid to bring green wood because each village sends a watchman, more illegal cutting goes on in the Lekh than in any other forest area, and, subsequently, the Lekh is a highly degraded forest.

The women mainly collect snowfall branches and decayed wood from the Lekh during winter season, that is from Push to Phalgun and from Mangsir to Baisakh. The main lower Lekh species are **karkalo**, **bilowne**, **towne**, **jingano**, and **nigaalo**, which are collected as small dry branches. The preferred higher Lekh species are **jingano**, **ruktachandan**, **dabdabe**, **machaino**, **sil timur**, **katus**, **chaap**, **phalant**, **gurans**, **utis**, and **towne**, which are usually collected in the form of larger green branches. Several of these species are the most preferred for fuelwood and several are also used as timber. Many of the larger trees in the Lekh have already been cut down to make houses, so only small trees are left. Men reported that the best **nigaalo** is found up in the Lekh beyond the tree line. To reach the higher area, men and women set out before the sun is up and return after dark.

Poudyal Ban: - Poudyal Gaun is a Brahmin settlement within Lahchowk, but separated from the main village by a large expanse of **khet** fields. There are 45 Poudyal households, all of whom are owner users in Poudyal Ban. Each family pays 5 **pathi** yearly for the services of the Poudyal Ban watchman.

Poudyal Ban is a natural forest of **katus**, **chilaune**, **mauha**, **ainselu**, **gurans** and **chutro**. The forest area lies between the Thakuri Ban and Ghumse Ban. Poudyal Ban is divided into two parts, **sanat** and **bijan**. **Sanat** is registered land; **bijan** land is not officially registered but has been bought from both the government and other land holders and is now under community use by the Poudyal. Poudyal Ban share holders, as well as paying the watchman, also pay a nominal fee for taking wood from the forest. One **bhari** of wood costs only 75 **paisa** (3/4 of a rupee), of which 25 go to the D.F.O., and 50 to the Poudyal Ban committee. Poudyal Ban has an area of 4 **pathi bijan**, which is enough for the households only because the women also travel to the Lekh for firewood.

Presently there is not enough fuelwood or fodder in the forest to meet the needs of the user households because the Poudyal Brahmin started protecting their forest only three years ago. Poudyal Ban is 200 years old, but the current forest is quite new. The forest history, as told by the Poudyal Brahmin, is as follows: At one time in the past the forest was destroyed completely through the argument and rash actions of five brothers. But, seeing the devastation of the forest and the bare hills that the years of feud had brought about, the Poudyal feared for their fields below lest they be washed away by landslide and erosion. So they replanted. This was only 25 years ago, so the forest has mainly young trees and shrubs. Under the current forest management and protection scheme the Poudyal have divided their forest into three plots, these plots being used in rotation, with each plot being used for one year while the other two remain fallow. During Phalgun-Chait, the Poudyal Ban committee allows the cutting of green wood (**mauha** and **katus**), usung a system somewhat similar as that described for Thakuri Ban. A licence must be obtained to cut timber within Poudyal Ban, as within Thakuri Ban. No chits are issued for large trees, so they go to the Lekh to get timber.

The Sarki and Damai of Thakuri Gaun and the Kami of Kami Gaun (the Kami caste area of Lahchowk) also use Poudyal Ban. They are not permitted to cut green wood, and if caught they are fined. Sometimes their baskets are destroyed and their sickles taken. The Poudyal claim that the lower castes practice the same kind of illegal activities in their forest as the Sunar do in Thakuri Ban - cutting green wood, hiding it, and letting it dry before bringing it home. The Poudyal feel, like the Thakuri do, that the lower castes want a "ready-made" forest. "They do not want to look after a plantation yet they always go to the D.F.O. to ask for forest."

The Poudyal feel that their forest serves as a protection for all of Lahchowk, as only 58 years ago (when their forest was scrub land), a big landslide swept away farms, fields, and houses in Lahchowk.

Rana Bhat Ban: - There are two parts of forest area owned by the Rana Bhat. The natural forest located within the Thulo Pakho area of Thakuri Ban is owned by a small group of Rana Bhat households. The area known as Rana Bhat Ban is a community forest planted on their own land near the village. The forest is looked after by the whole Rana Bhat community. The main species is **utis**.

Reban and Gahchowk Ban: - Thakuri Gaun households sometimes exploit the forests of two nearby communities. Reban is a Gurung settlement on the hill north-west of Lahchowk. Reban Ban is visited by Sunar women, who pay Rs.10-12 for a **bhari** of green fuelwood. Sunar women to go the high forests of Reban and Gahchowk (a multi-caste but mainly Brahmin village to the east of Lahchowk) in the winter when there is not enough fuelwood in Thakuri Ban. There they collect fodder, fuelwood, bamboo for baskets, and green branches and small trees for building cattle sheds. This green wood they "steal," hiding it first and then bringing it home later. The people of Gahchowk consider the Andre River as the dividing line between Gahchowk forest and Lahchowk forest.

The Gahchowk forest is divided between the Brahmin, Magar, Pun (a type of Magar), Gurung, Thakuri, Sarki and Damai, Kami, and Newar villagers of Gahchowk. The committee for Gahchowk Ban includes all castes, but no women. Between 180-85 households have a share in the forest, and each household must give 12 **muri** annually to the watchman. The D.F.O. of Gahchowk reported that, unlike Thakuri Ban, there is no **bijan** system at work in Gahchowk Ban; all households have an equal share in the community forest. But the villagers stated that the forest is administered according to **bijan**. They said that **bijan** is held not by households but among a group of brothers, and passed down to their sons. Reportedly, all castes do this.

The allocation of green wood is based on need. Green wood is cut in Gahchowk Ban during Magh-Phalgun by only those households who have collected, in the previous year, less than 30 **bhari** of dry wood. The Gahchowk committee usually allows 80-85 households to cut green wood annually. It is prohibited to cut timber species in the forest. As all Gahchowk villagers, including the occupational castes, have **khet** and **bari**; field residues, especially maize stalks, are burned to supplement firewood.

Sarkari Ban: - Sarkari Ban is a landslide area that used to be a part of Thakuri Ban. The area is now planted and belongs to the government. Like most government plantations, Sarkari Ban is a mono-crop forest. **Utis** is the main species, but within the plantation are **chilaune**, **salla**, and **painyu** tree species. As of 1992, no one is allowed to cut within Sarkari Ban. According to the villagers, the land that is now the plantation used to be a grass cutting area. As much of the grass was cut to create the plantation, many women must now go higher up to cut grass.

Thulo Pakho Ban: - This the boundary of Thakuri Ban and Rana Bhat Ban and is an officially registered forest. The owners of this forest are Rana Bhat of ward 1. There are only 13- 14 households that have shares in this forest. These user households have their own forest watchman.

APPENDIX F: Table of Latin, English and Nepali Species Names

Latin	English	Nepali
Abies pindrow		Thige salla
Abies pindrow	--	Gobre salla
Acacia catechu	Acacia	Khayar
Acer oblungum	--	Raat paate
Achyranthes bidentata	--	Datiwan
Aconitum spicatum	Poison	Bikh
Adhatoda vasica	--	Asuro
Alnus nepalensis	--	Utis
Aloe barbadensis	--	Kumari
Anthocephalus cadamba	--	Kadam
Artemisia vulgaris	--	Tite
Artocarpus lakoocha	--	Badahar
Arundinaria intermedia	Bamboo	Nigaalo
Bassia latifolia	--	Mahua
Bassia butyraceae	--	Chiuri
Bauhinia purpurea	--	Tanki
Berberis asiatica	Barberry	Chutro
Bombax malabaricum	--	Siris
Brassiopsis hainla	--	Chuletro
Buddlija asiatica	--	Dhurse/Dhurseli
Calotropis gigentea?	--	Ankhe timur
Calotropis gigentea	--	Ankh
Castanopsis indica	Chestnut	Katus
Castanopsis tribuloides	--	Musure katus
Cedrella toona	--	Thowne
Cedrus deodora	Cedar	Dewadaar
Centella asiatica	--	Gholtapre
Choerospondias axillaris	--	Lapsi
Chonepodium album?	--	Bhate
Cinnamomum zeylanicum	--	Dalchini
Citrus medica	--	Bimiro
Citrus nobilis	Orange	Suntala
Dalbergia sissoo	--	Sisau
Dendrocallamus strictus	Bamboo	Baans
Drepanostachyum spp.	Bamboo	Malingo nigaalo
Elacagnus latifolia	--	Guieli
Emblica officinalis?	--	Pani amala
Emblica officinalis	Emblic	Amala
Emphorbia royleana	--	Suindi
Equisetum debile	--	Ankhle
Erythrina stricta	--	Phaledo
Euohorbia royleana	--	Silajet
Eurya acuminata	--	Jingano
Ficus hispida?	--	Thotne
Ficus subrincisa	--	Gedulo
Ficus bengalensis	Banyan	Bar
Ficus religiosa	--	Pipal

Latin	English	Nepali
Ficus semicordata	--	Khanyu
Ficus lacor	--	Kaabhro
Ficus clavata	--	Berulo
Ficus nemoralis	--	Dudhilo
Ficus roxburghii	--	Nihbaaro
Ficus glaberrima	--	Paakhure
Ficus spp.	--	Timila
Garuga pinnata	--	Dabdabe
Gmelina arborea	--	Khamari
Gntiana kurroo	--	Kharu/Karu
Helicteres isora	--	Kapase
Hibiscus rosasinensis(Nerium indicum?)		Baramase
Jatropa curcas	--	Sajiwan
Juglans regia	Walnut	Okhar
Lagerstromia indica	--	Asare
Lithocarpus elegans	--	Arkhalo
Litsea polyantha	--	Kutmero/Kutmiro
Macaranga pustulata	--	Malaato
Machilis odoratissima(Machilus gamblei?)		Kaulo
Maesa chisia	--	Bilaune
Mangifera indica	Mango	Aamp
Melia azadarach	--	Bakiano
Michelia champaca	--	Chaap
Mussaenda macrophylla	--	Dhobini
Myrica esculenta(morus indica?)	Mulberry	Kafal
Nardosyacys jatamansi?	--	Jattamanse
Nephrolepis cordifolia	--	Panisaro
Nerium indicum	--	Baramase
Nyctenthus arber-tristis	Jasmine	Rudhilo
Orchis latifolia	Orchid	Panch aumle
Paris polyphylla	--	Satua
Phyllanthus parvifolius?	--	Karaute
Pieris (Lyonia?) ovalifolia	--	Angeri
Pinus roxburghii	Pine	Salla
Prunus persica	Peach	Aaru
Prunus cerastoides	Himalayan Cherry	Paiyu
Prunus napaulensis	--	Arupate
Psidim gaujava	Guava	Amba
Pterpcarpus santalinus	--	Ruktachandan
Quercus dilatata	--	Moru
Quercus spicata	--	Arkalo
Quercus semicarpifolia	--	Khas(h)ru
Quercus lamellosa	--	Thulo Phalant
Quercus Glauca	--	Phalant
Quercus langinosa	--	Sano Phalant
Reinwardtia trigyra	--	Pyauli
Rhododendron spp.	Rhododendron	Gurans
Rhum emodi	Rhubarb	Podamchal
Rhus semialata	--	Bhakimlo

Latin	English	Nepali
Rubus ellipticus	--	Ainselu
Salmalia malabaricum	--	Simal
Saxifraga ligulata?	--	Pakhanbed
Schima wallichii	--	Chilaune
Shorea robusta	--	Saal
Solanum verbasifolium	--	Durseli
Solanum xanthocarpaum	--	Kantakeri
Stephania hernandifolia	--	Batul(i) pate
Terminalia alata	--	Asna/Saj
Terminalia chebula	--	Harro
Tinospora condifolia	--	Gurjo
Trachelosoermum fragrans	--	Dudhe lahara
Tribulus terrestris	--	Gokhre
Urtica dioca	Nettle	Sisnu
Woodfordia floribunda	--	Dhayaro
Wrightia antidysenterica	--	Khirro
Zanthoxylum armatum	Pepper	Timur
Zanthoxylum oxyphyllum	--	Sil timur
Zingiber officinale	Ginger	Aduwa
Zizyphus jujuba	--	Baya(i)r
?	--	Gunaune
?	--	Halale
?	--	Nirbangsi
?	--	Maalo
?	--	Dankarno
?	--	Haledo
?	--	Machaino
?	--	Barimal
?	--	Muni
?	--	Dare kanda
?	--	Umpi
?	--	Ubijallo
?	--	Katare
?	--	Siru
?	--	Babiyo
?	--	Mohini kanda
?	--	Dhaijallo
?	--	Chiple
?	--	Dahi chamal
?	--	Charchare
?	--	Karkalo
?	--	Hade lasun
?	--	Gai khure
?	--	Maleeti
?	--	Dubo
?	--	Kalnigro
?	--	Jwano
?	--	Dhairo
?	--	Siuri

Latin	English	Nepali
?	--	Pathi
?	--	Nilkanta
?	--	Barbari
?	--	Badhar
?	--	Saharo
?	--	Hatityan
?	--	Karkagadi
?	--	Gai tihara
?	--	Lalupate
?	--	Harowlo
?	--	Samo
?	--	Maleero
?	--	Baydulo
?	--	Karduch
?	--	Khamle
?	--	Silagit
?	--	Bameri
?	--	Ulna
?	--	Silinge
?	--	Dar
?	--	Lakuri
?	--	Narianci

APPENDIX G: Nepali Months

Nepali Months	Julian Months
Baisakh	April/May
Jeth	May/June
Asar	June/July
Saun	July/August
Bhadau	August/Spetember
Asoj	September/October
Kartik	October/November
Mangsir	November/December
Poush	December/January
Magh	January/February
Phalgun	February/March
Chait	March/April